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Forest Service
Southern Region

The Southern National Forest's Migratory and Resident Landbird Conservation Strategy

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Includes Program Guidance for Most Neotropical Migratory, Temporate Migratory, and Resident Birds

Fisheries, Wildlife, and Range Unit
Atlanta, Georgia
June, 1996

United States Department of Agriculture **Forest Service** **Southern Region**

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Subject: Southern National Forest's Migratory and Resident Landbird Conservation Strategy

To: Chief
Director, Southern Research Station
Forest Supervisors
Forest Manager

Enclosed is the Southern National Forest's Migratory and Resident Landbird Conservation Strategy. This strategy provides guidance to national forests for incorporating landbirds into the decisions of upcoming forest plan revisions, a regional monitoring program, and guidance for information management. This document makes no decisions regarding the management of national forests. These decisions will be made during the forest plan revisions and during project-level implementation.

The strategy provides guidance for incorporating Partners in Flight (PIF) high priority birds into the decisions made during forest planning. The strategy provides a process and example (See appendix B) for accomplishing this. A good example of how this guidance has been used can be found in the Southern Appalachian Assessment (SAA) Terrestrial Technical Report. I recommend that you take a look at this SAA report.

The significant portion of the strategy is the monitoring program. The implementation of the monitoring program has been underway since January, 1995 (Regional Forester 2620/1920 letter, 1/27/95). By the end of FY98, 100 percent of this program is scheduled to be operational. Close coordination among forests within common physiographic units will be necessary for the proper implementation of the monitoring scheme. In these times of decreasing budgets and increasing pressure on our workforce, I encourage the forests to continue exploring different ways to implement this program, including outside sources such as volunteers, other agencies, or contracts.

Finally, a relational database to house this information is currently under development for use with our new IBM systems. This will be available in the near future. Information generated from this program will be used to monitor individual forest plans, determine trends in bird populations on national forests, validate species/habitat relationships, determine relative abundance of bird species on national forests, and will provide significant information to the overall efforts in the PIF initiative.

I feel this strategy serves as a good model for future efforts in the planning, management, and monitoring of natural resources at the various scales that we work.

ROBERT C. JOSLIN
Regional Forester

cc David Pashley, Partners in Flight National Coordinator
Chuck Hunter, Partners in Flight SE Coordinator
Bob Ford, SEWG Chair
Partners in Flight State Agency Coordinators

The Southern National Forest's Migratory and Resident Landbird Conservation Strategy

Includes Program Guidance for Most Neotropical Migratory, Temporate Migratory, and Resident Birds

June, 1996

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Acknowledgments

The development of this Strategy began a little over a year ago with the aim of developing a framework for the consistent management and monitoring of forest landbirds on the Southern National Forests. This Strategy is the culmination of the past works and leadership of many dedicated researchers and wildlife managers involved in landbird conservation.

There are three people that I want to acknowledge as key to this project. They are Dr. Paul Hamel, U.S. Forest Service, Chuck Hunter, U.S. Fish and Wildlife Service, and Eddie Morris (co-author), U.S. Forest Service. These individuals are leaders in applying the concepts and methods described in the Strategy. Paul Hamel's, The Land Manger's Guide to the Birds of the South, and his work on monitoring protocol were relied on heavily. Chuck Hunter's Prioritization Scheme for landbirds was utilized and is the basis for identifying the priority bird species that are the focus of the Strategy. Eddie Morris' leadership on the Chattahoochie-Oconee National Forest, has resulted in the field applications of the point count monitoring techniques described and provided much needed insight into the development of the monitoring standards in the Strategy.

Many were asked to review and to provide input to this Strategy at different stages of development. I thank the Forest WF&B Staffs, Southeastern Partners in Flight members, researchers, state wildlife agencies, the Southern Timber Purchasers Council, and the Southern Appalachian Forest Coalition for their valuable technical comments and recommendations. Most of these were incorporated where possible. A special thanks to a group of Forest Service biologists, planners, and foresters, who met in October, 1994 to work through sticking points in the Strategy. Their work was important and constructive. Those involved in that meeting included Larry Hedrick, Jimmy Huntley, Ricardo Garcia, Laura Mitchell, Lynda Perry, Craig Watson, Donna Bayless, Scott Klinger, Skip Griep, Ken Dancak, Carol Hardy, Rod McClanahan, Doreen Miller, Jerry Davis, Steve Duzan, Beth LeMaster, Bill Jarvis, Warren Starnes, Kathleen Franzreb, Karl Stoneking, Paul Arndt, Bob Wilhelm, and Steve Weaver. I also want to thank Steve Rickerson and Marilyn Robertson for guidance that they provided throughout this process.

I hope that the "Landbird Strategy" will be a useful tool in the management of the Southern National Forests and that it may help guide future efforts in planning for terrestrial and aquatic wildlife and botanical resources as the Forest Service implements the ecological and social principles of Ecosystem Management.

Glen Gaines

The Southern National Forest's Migratory and Resident Landbird Conservation Strategy

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The Southern National Forest's

Migratory and Resident Landbird

Conservation Strategy

Includes Program Guidance for Most

Neotropical Migratory, Temperate Migratory, and Resident Birds

June, 1996

Introduction

In the late 1980s, concern started to surface over evidence of long-term population declines of many neotropical migratory birds (NTMB). The evidence for these declines came primarily from the analysis of data collected from the Breeding Bird Survey (BBS) routes between 1966 and 1987 (Robbins, 1992). Two primary factors have been advanced to explain these population declines. These are: (1) loss of breeding habitat due to habitat fragmentation and habitat loss to land-use changes in the United States and Canada; and (2) loss of wintering habitat in Latin America and the Caribbean (NTMB Workshop, 1991). An additional factor could include loss of important stop over habitat during migration (Moore, et al, 1992).

In response, the Partners in Flight Conservation Program (PIF) was initiated by the National Fish and Wildlife Foundation in 1990 (NFWF, 1990). An important component of PIF is the formation of partnerships consisting of organizations and government agencies, working together at different levels to achieve the overall goals of this program. The primary goal is to focus resources on the improvement of monitoring, research, management, and education programs involving neotropical migratory birds and their habitats (NFWF, 1990).

The USDA Forest Service (USFS) has played a leading role in the PIF Conservation Program since the programs inception in 1990. The National Forest System (NFS) has

been highlighted as important "reserves" of secure breeding habitat in the United States. The conservation of NTMB has fast become one of the top wildlife management priorities on the Southern National Forests. However, NTMB are not the only bird species that are exhibiting declines across the South. For example there is concern over recent population trends and habitat loss across the southeast for the northern bobwhite quail. The status of temperate migrants and resident bird species are of equal importance and will be given equal consideration. The NFS in the South will play an important role in contributing to the long-term conservation of NTMB, temperate migratory birds, and resident birds native to the region. It is now time to provide a specific strategy for how the Southern National Forest will be a leader in the conservation of forest birds in the South.

The strategy includes 1) program goals, 2) objectives, 3) Regional responsibilities and programs, 4) Forest responsibilities and programs, 5) a comprehensive monitoring program (including research) that will provide meaningful information at different levels, and 6) information management.

Program Goal

The goal for the Southern National Forest is to provide and sustain habitats for neotropical migratory birds, temperate migratory birds, and resident birds that will support populations at desired levels for the long-term that are stable, healthy, and safe from the threat of extirpation. These populations and their habitats will contribute significantly to the overall regional, physiographic, and individual state strategies for conserving migratory and resident bird species.

Program Objectives

The objectives for this strategy are:

1. To incorporate the concept of planning for this resource across multiple Forests that share common physiographic areas. The objective is to have the 16 National Forests (Supervisor's Offices) and 105 Ranger Districts in the Southern Region organized into 10 physiographic units based on physiographic areas (Robbins, 1986) for the purpose of planning, implementing, and monitoring this strategy.

2. To standardize and implement a system for managing the information for forest birds as part of the Wildlife, Fisheries, and Botany Resource Inventory, Tracking, and Analysis Applications (RITAA) by 1997. This database will be designed to track the population and habitat monitoring information and to utilize that information for monitoring Forest Land and Resource Management Plans, assessing the contribution and status of the 10 physiographic units individually or as a whole for the Southern Region, to contribute information and data to other agencies and organizations in assessing the overall status of any bird species in

question, to validate assumptions regarding habitat/species relationships in order to improve our planning/monitoring efforts, and to maintain a credible record related to the status of these species through time.

3. To develop habitat capability and habitat condition objectives, along with consistent standards/guidelines to achieve the objectives, for 100 percent of the high priority species identified for each physiographic unit by 1998. This objective will be dependent on the completion of the Forest Plan revisions.

4. To develop and implement a standardized forest bird monitoring program that will measure the success in achieving population and habitat objectives at the district, forest, and regional level and contribute data to the overall understanding of the trends and status of NTMB and other forest birds. Four of the ten physiographic units will be fully implementing their monitoring strategies by 1996 and 100 percent of the Region will be operational by 1998 (Appendix C).

Regional Program

The Regional Program will include 1) dividing the National Forests and Ranger Districts into 10 physiographic units based on the physiographic areas in which they reside, 2) tracking at a minimum the identified regional and physiographic unit high priority species and objectives for these species, 3) providing guidance through sub-regional assessments and forest plan revisions in order to address habitat requirements and to develop consistent standards and guidelines to achieve those habitats, 4) management of a regional database and the evaluation of data, 5) provide the tools and resources to conduct environmental analysis, planning, and monitoring, 6) coordinate efforts among different National Forests and between National Forests and states, 7) represent the Southern Region on the Partners in Flight (PIF) Southeast Working Group, and 8) provide information and training opportunities (See Figure 1).

Regional Physiographic Units

The physiographic units are based on the physiographic area (Robbins, 1986) used in the BBS. The use of these areas as physiographic units will be consistent with the PIF federal, state, and private partners. These physiographic units are easily crosswalked with Forest Service Ecological Classification, Mapping, and Inventory efforts for sections or subsections. The physiographic units consist of different combinations of sections and subsections.

The physiographic units group Forests and Ranger Districts into units that are similar ecologically in order to:

1. Help determine the bird species that may be emphasized as management indicators in the Forest Land and Resource Management Plan (FLRMP) revisions.

2. Help multiple Forests that are ecologically similar plan for forest birds across Forest boundaries in a consistent manner.

3. Develop comprehensive and affordable monitoring programs.

The physiographic units and the corresponding National Forests are shown in Table 1.

Priority Bird Species of the Southern National Forests

A total of 49 species and subspecies of NTMB, temperate migratory birds, and resident birds have been identified as having the highest regional priority for conservation attention for the Southern National Forests (Table 2). Individual national forests will use the physiographic unit priority species lists (Tables 3 - 12) in planning and management activities. The species list was based on the regional prioritization scheme for the Southeast developed by Hunter, et al, 1992a. The regional priority scores used to rank species are based on the following 7 factors:

1. Global abundance
2. Global breeding distribution
3. Global wintering distribution
4. Threats to breeding
5. Threats to non-breeding
6. Regional population trends
7. Importance of the area (region or physiographic area)

In addition, important game species and species with some demanding habitat requirements have been included. Game species are included because of the important social value placed on these species receive. Also, some of these species have declined in numbers in recent years, such as northern bobwhite, ruffed grouse, and American woodcock. Additional species were added that required special habitat components, such as large snags or cavity trees.

The regional list will be used to track the success of the Southern Region in assessing our progress in achieving the objectives related to habitat capability, acres of habitat, actual populations, and population trends. The basis for developing and finalizing the specific regional objectives, the regional habitat strategies to achieve the objectives, and regional monitoring programs will be the individual Forest Land and Resource Management Plans. This phase of the strategy will be discussed in the Forest Program section of this document.

Besides the previous 49 species, there are an additional 33 NTMB, 9 temperate migrants, and 5 resident species that are of high concern (score 19-23) for which monitoring is recommended at a minimum (Appendix A.)

Regional Habitat Priorities and Issues

Regional Priority Habitats

Several broad habitat groups have been identified that are important to forest birds (Hunter et al, 1992). The habitats listed here are priority habitats important to the success of the overall Southern Region efforts in this strategy. Where these habitats will be specifically provided will be shown in the Forest Program section of this document. It should be noted here that the habitats identified and the levels at which they will be sustained on National Forests will not be based solely on the needs of the priority forest birds contained in this strategy, but additional wildlife, fisheries, and botanical resource commitments, as well as other ecosystem management objectives.

The important habitats include:

- Bottomland Hardwood-Bald Cypress Forest
- Riparian Streamside Woodlands
- Maritime Uplands (Atlantic Gulf Coastal Plain)
- Longleaf Pine Forests
- Shortleaf Pine Forest
- Pocosins/Carolina Bays
- Mixed Spruce-Fir/Northern Hardwood Forests
- Upland Hardwood Forest
- High Elevation Heath Balds, Old fields, and Shrub-Scrub
- Upland Hardwood-Pine Mix (West Gulf Coastal Plain)
- Post Oak Woodlands (Oaks and Prairies)
- Table Mountain-Virginia-Pitch Pine
- Wet Tropical Highlands

Forest Fragmentation

A major bird conservation issue of today is fragmentation and its effects on forest interior NTMB species. Although much discussion and recent research has centered on this issue, there continues to be a wide range of opinions concerning this issue. The following is the Southern Region's discussion and position on fragmentation in the context of National Forest management.

Background

The recent declines in populations of NTMB in the eastern United States have been linked in part to forest fragmentation of the breeding habitats (Robbins et al., 1989). A majority of the species documented to be declining are forest interior or interior-edge birds (Witcomb et al., 1981). The result of increased fragmentation is an increase in the proportion of forest edge to forest interior. Research on this issue is separated into that occurring (1) in landscapes dominated by agriculture and (2) in forest dominated landscapes.

Agricultural/Developed Landscape

It has been documented that forest interior birds have lower reproductive success near forest edges due to low mating success, increased nest depredation, and increased brood parasitism (Thompson, 1992).

Robinson et al. (1995) found a significant correlation of decreasing nesting success as proportion of forest cover in larger landscapes decreased. This study of fragementation in nine midwestern landscapes found that nest parasitism increased as percent forest cover decreased. For example most wood thrush nests were parasitized in landscapes with less than 55 percent forest cover. In addition, the ovenbird, worm-eating warbler, Kentucky warbler, hooded warbler, and the indigo bunting all had extremely high daily predation rates in the most fragmented landscapes.

Gibbs and Faaborg (1990) found for ovenbirds that approximately 75 percent of the territorial males were unmated in small forest fragments (ranging in size from 22 acres to 346 acres in an agricultural setting) compared to approximately 25 percent of the males being unmated in large, contiguous tracts (greater than 1,235 acres unbroken by open habitats, excluding roads, found in the Mark Twain National Forest). In addition, densities of territorial male ovenbirds were 1.5 times higher in the contiguous tracts.

Temple and Cary (1988) examined the dynamics of forest interior bird species in fragmented habitats (habitat fragments in an agricultural, non forested landscape) in southern Wisconsin. They developed a computer model containing parameters based on previous field research to examine the effects of unfragmented, moderately fragmented, and severely fragmented habitats of a hypothetical population of forest interior birds. Their model suggested that in a severely fragmented landscape, forest interior birds will decline and eventually abandon small woodlots that do not contain habitats greater than 650 feet from an edge.

Robbins et al. (1989) developed minimum area requirements for area-sensitive species in the mid-Atlantic states. Some examples from this work include Acadian Flycatcher (37 acres), Wood Thrush (2.5 acres), Red-eyed Vireo (6 acres), Black-throated Blue Warbler (2,471 acres), Cerulean Warbler (1,730 acres), Pileated Woodpecker (408 acres), and Louisiana Waterthrush (865 acres). Robbins concluded that most of the area sensitive

species needed tracts greater than 7,400 acres in size for the probability of occurrence of these species to be at maximum. In addition Keller et al. (1993) found that riparian forests in agricultural landscapes in Maryland and Delaware would provide habitat for most area-sensitive species if they were greater that 328 feet in width. This work was based on point count data.

Forest Landscapes

Welsh and Healy (1993) looked at bird species diversity and composition in an extensively forested landscape, in the White Mountain National Forest in New Hampshire. They compared reserved areas with no acres in the 0-30 year age classes to managed areas with 18 percent of the area in 0-30 year age classes. They included 53 bird species in the diversity analysis. All 53 species were found in the managed areas. Thirty three species were found in the reserved areas. The 4 most abundant species in the reserved areas were the ovenbird, red-eyed vireo, black-throated green warbler, and black-throated blue warbler. The same 4 species were among the 5 most abundant species in the managed areas. The additional species was the American redstart. The ovenbird was the one species more abundant on the reserved area than the managed area. Nine species that included the scarlet tanager, red-eyed vireo, black-throated blue warbler, Swainson's thrush, rose-breasted grosbeak, American redstart, and veery were more abundant in the managed area. This study utilized point count data.

Work in the Missouri Ozark forests (Thompson et al., 1992) compared densities of breeding forest interior birds in areas managed with clearcutting to areas with no recent timber harvest or disturbance in the Mark Twain National Forest. The areas with clearcuts contained approximately 10 % regeneration habitat (0-10 years), 10 % sapling (11-20 years), and 80 % pole-sawtimber habitats. The study found that 3 interior species (scarlet tanager, red-eyed vireo, and pine warbler) had lower mean densities in the areas with clearcuts. Even with lower densities, the red-eyed vireo had densities 3 times greater than the next most abundant species in the areas with clearcuts. Three interior species (black-and-white warbler, worm-eating warbler, and Kentucky warbler) had greater densities in the clearcut areas. The densities of acadian flycatchers, ovenbirds, and wood thrushes did not differ between areas. In addition blue jays, American crows, and brown-headed cowbirds occurred in similar numbers between areas. The study concluded that while forest interior bird populations may be reduced in forest fragments due to edge effects, this did not appear to be the case in extensive forests managed by clearcutting in Missouri. The study suggested that in extensive forest areas, forest management practices utilizing clearcutting is compatible with the goal of maintaining viable populations of neotropical migrant birds, although some species will be less abundant, and others more abundant than in forests with no timber harvests.

Recent work by Robinson et al. (1995) found that the extensive forests of the Misouri Ozarks, northern Wisconsin, and south-central Indiana have low levels of nest parasitism and predation and may provide the surplus birds needed to maintain populations in the highly fragmented landscapes. In heavily forested landscapes cowbird populations may be

limited by the availability of foraging. Cowbird parasitism is so low and is unlikely to be a significant cause of reproductive failure in these heavily forested landscapes. In addition, nest predation is also lower as the proportion of forest cover increases. In this study, the heavily forested landscapes had forest cover generally greater than 80 percent.

Effects on breeding birds communities have been studied in the intensively managed Barrens Grouse Management Area in Pennsylvania (Yahner, 1984). The area consisted of a uniform pattern of 2.5 acres patches (stands) totaling approximately 336 acres. A total of 36 % (in 2.5-acre patches) of the area had been harvested. It was found that the red-eyed vireo exhibited a higher population density in the area with no treatments. Seven species associated with early successional habitats (gray catbird, eastern bluebird, golden-winged warbler, chestnut-sided warbler, ovenbird, and field sparrow) exhibited higher population densities in the treated areas. A total of 28 species were common to both areas. The study concluded that at the levels of cutting when the study was conducted, the treated area was apparently not fragmented enough to negatively affect forest interior species, with the exception of the red-eyed vireo. Additional work looked at nest predation using artificial nests (Yahner and Scott, 1988). This study found that nest fate was dependent on the intensity of forest fragmentation. In the study, 9 % of nests were disturbed in zero fragmented zones, 19 % of nests were disturbed in 25 % fragmented zones, and 68 % of the nests were disturbed in the 50 % fragmented zones. Of the nests disturbed, 72 % of the nests were disturbed by birds and 28 % by non-avian predators. The study suggested that when abundant edge is created by forest fragmentation, corvids (blue jays, crows) can become concentrated. Consequently, avian nest predators may impact the nesting success of woodland birds as fragmentation of mature forests increase.

Chasko and Gates (1982) conducted a study related to avian habitat suitability along transmission lines. In one study site they found that in the forest (60 year old oak/hickory) adjacent to the transmission corridor, the fledgling success increased with increasing distance from the edge. This was in part due to lower predation losses farther from the edge. In the other study site, there were no obvious trends based on fledgling success and edge for forest birds. However, predation losses were concentrated near the edge. Mammals were the primary predators in this study.

A nest predation study was conducted in Maine in a forest dominated landscape (Rudnicky and Hunter, 1993). It was found that neither clearcut size nor forest tract size exhibited a consistent relationship with predation density. Distance to edge had no apparent effect on predation of ground nests. The predation of shrub nests on the edge was higher compared to either ground nests on the edge, or ground and shrub nests in the forest interior. The study was conducted in an area characterized as 88% forested, 7% clearcut, 2% water, and 3% other. Artificial nests were used in the study.

Discussion

There are some points that resource managers should keep in mind when planning and implementing strategies to sustain habitats for the forest birds. A common theme among these points is that "it depends". Some points to remember are:

Location - The landscape conditions are key as they relate to forest birds and the effects of implementing management strategies. For instance the effects on forest interior species by adjacent edge habitat is probably different in small, isolated National Forest tracts surrounded by an agriculturally dominated landscape (isolated forest patches) as opposed to larger, consolidated tracts of National Forest land that would be considered a forest dominated landscape (continuous forest containing patches of early successional habitats).

National forests lands interspersed in an agriculturely dominated landscape should take into account the negative effects of some forest activities to forest interior habitats. The effects of edge will may be more pronounced in this situation, in comparision with national forests located in heavily forested landscapes. The opportunity for nest parasitism by the brown-headed cowbird and nest predation appears to be higher in the agriculture landscapes.

Degree of Habitat Mixes - The amount of early successional forest and the amount of continuous canopy forest in a forested landscape is important when considering fragmentation and edge effects.

In forested landscapes that sustain a higher percentage of early successional and edge habitats (i.e. 30 to 40 year rotations), the continuous forest habitat will likely be less productive for interior species due to the compounded "edge effects" caused by the higher presence of early successional habitat. This "edge effect", in combination with the higher percentage of the area in unsuitable conditions (early successional habitats) for forest interior species, the "area effect", may limit the feasibility of these areas to provide productive habitats for forest interior species.

In forested landscapes that sustain a smaller percentage of the landscape in early successional and edge habitats (i.e. multiple-use management), the "edge effects" may not be as dominant in the continuous forest habitat. The primary factor limiting the capability to support breeding habitat for forest interior species in this landscape will be the "area effect". The larger percentage of the landscape that is sustained in continuous forest conditions will provide productive habitats for breeding for interior species. Based on the available information today, the presence of a low percentage (i.e. less than 20 percent) of grass/forb and shrub/sapling habitats (0-20 years) in these landscapes will not result in degradation of the dominant continuous forest habitats to unsuitable for interior species, due to edge effects or patch isolation associated with forest fragmentation (Thompson et al., 1992). The decision to have a small percentage of early

successional habitat in a forest dominated landscape is not an "either or" decision related to sustaining interior species and may be necessary in order to meet the habitat needs for a significant number of native plants and animals (including high priority bird species) as mandated by the National Forest Management Act (NFMA).

Types of Edges - All edges are not created equal. For instance the edge associated with an early successional forest and older forest is not the same as edge associated with improved pasture and a woodlot. The edge associated with a grass/forb successional habitat and a continuous canopy forest is not the same as edge associated with shrub/sapling successional habitat and older forest. The edge associated with a longleaf/wiregrass community and a bottomland hardwood community in coastal plain forests is not the same as edge associated with a Virginia Pine community and cove hardwood community in mountain forests. The point here is that general comments concerning edge require qualification. Forests should develop the desired levels of early successional habitats based on local situations (where they are).

Perceptions of Edge - Much of the debate concerning edge centers on judgments and opinions related to traditional and emerging viewpoints. Edge habitats have been characterized on the one hand as "biological traps" for interior nesting species and as promoting "trash species", while on the other hand as providing habitat high in species richness and important to considerations for game production. Some of these characterizations are based more on emotion and bias, rather than taking a rational look at the role of edge habitats.

On National Forests, early successional habitats with their associated edge that is provided can be a desired component of the landscape. The levels at which habitats will be sustained will be based in part on a Forest's overall objectives to sustain a particular mix of the wildlife and botanical resources.

Position Statement

Information and knowledge about forest interior bird species/area sensitive species related to the affects of landscape conditions in a forest dominated versus an agricultural/developed landscape is expanding rapidly and will continue to do so. We base our position on the best available information today and will amend the position if future information dictates.

It is the Southern Region's position that the management of National Forests that results in a landscape dominated by mid-successional and late successional continuous forest canopy conditions, will provide the capability to sustain productive and healthy populations of breeding birds associated with forest interior habitats. In most situations on National Forests a desired condition is to provide a small percentage of the landscape in well distributed early successional habitats, of

varying sizes, to sustain populations of the high priority species associated with these habitat conditions. Interspersing these early successional habitats will not conflict with the commitment to sustain habitats for the high priority forest interior/area sensitive bird species and is necessary in order to meet the habitat needs for a significant number of native plants and animals (including migratory and resident birds) as required by the NFMA. In addition, for most situations on National Forests, it is probably not necessary to "zone" areas of the forest (based on estimates of area species requirements) that will contain no early successional habitat, in order to provide for area sensitive species.

Regional Database Management

The Regional Office FWR staff will develop a Regional database for migratory and resident forest bird populations and habitats. The information will be will be housed in the FW&R Resources Inventory, Tracking, and Analysis Applications (RITAA). This Oracle relational database will be used at the district/forest levels to house point count bird/habitat data, spot mapping bird/habitat data, individual species monitoring data (i.e. RCW, turkey), and species demographics data. The information at this level will be utilized to monitor FLRMP implementation and effectiveness and to provide information in order to assess population/habitat status and trends at higher hierarchical levels. The database will be used at the regional level as a data center to store the information provided by the Forests in order to access the status of forest bird species and associated habitats for Forests grouped by physiographic unit (PIF physiographic areas) and the Southern Region as a whole. The regional data will be made available to PIF corporate data centers in order to access the overall status and trends of migratory and resident bird populations and habitats in the southeastern United States. A more detailed discussion of the database is located in the Information Management section of this strategy.

The Forest/Districts FWR Staff will be accountable for the maintenance, quality, and evaluation of the data housed at the local level. The Regional FWR Staff will be responsible and accountable for the development of the database structure and forms, for the maintenance, quality, and evaluation of multiple forest and regional data that will be housed at the Regional level, and for monitoring the information management quality standards. The standards for information management at all levels are discussed in the information management section.

Planning/Analysis/Monitoring Tools

There are important tools provided by the Regional FWR Staff that will be necessary in planning and monitoring the programs related to this strategy at all levels, but especially at the district/forest level.

The Land Manager's Guide to the Birds of the South (Hamel, 1992) was published as a cooperative effort between the Forest Service and The Nature Conservancy. The Guide

provides key information that includes narrative summaries of biology and range distributions, qualitative bird-habitat association matrices for 23 vegetation types and 4 classes of seral stages for each type, and appendices that summarize key habitat associations and parameters for each bird species. The matrices are available on a 3.5" floppy disk for use on Lotus and Excel spreadsheets.

Presently under development is BIRDHAB, the computerized application of Land Manager's Guide to the Birds of the South (Hamel, 1992). BIRDHAB is a UNIX-based program that links the qualitative habitat descriptions given in the bird book with Region 8's forest stand database (CISC) and displays the information spatially in the GIS. The resource manager has the capability to either query a list of species that may occur within an analysis area (based on habitat descriptions/CISC data) or query the habitat quality for a given species or group of species (such as TES). Future applications will include environmental effects analysis, monitoring, and WF&B planning.

HABSIM, a quantitative habitat capability model, is presently available for use by the Forests and Districts. HABSIM is part of the COMPATS system of computer programs. HABSIM generates habitat capability outputs to reflect the estimated numbers of animals or animal units that an area could support. Coefficients can be developed for bird species based on forest type, age classes, and activities (i.e. prescribed burning, thinning, opening construction). Applications include environmental effects analysis, monitoring, and WF&B planning. In the future the qualitative nature of BIRDHAB and the quantitative nature of HABSIM will be available in a single model that is quantitative and spatial in nature.

Coordination Efforts

The Regional FWR Staff will help to coordinate and organize future planning and implementation activities that will occur among multiple Forests within the physiographic units, between Forests and state/multiple states projects, and between Forests and PIF physiographic partners.

PIF Southeast Working Group

The Regional FWR Staff will represent the Southern National Forests in a leadership role on the PIF Southeast Working Group (SEWG). Responsibilities for the FWR Staff will include working with the U.S. Fish and Wildlife Service and the SEWG Chairperson in planning the annual SEWG Meeting, serving as Secretary for the SEWG, distributing SEWG information to member state, federal, and private organizations/individuals, and to help develop and focus SEWG priorities.

Training and Education

The Regional FWR Staff will distribute to the Forests information related to the latest research on current issues, information and education material, and notices of current

meetings and training opportunities. A special need will be the training of employees with differing skills and backgrounds in bird identification and census techniques. We will utilize existing courses (i.e. East Tennessee State University) and develop opportunities in different regions of the southeast for this type of training.

Forest Programs

The Forest Programs should include 1) consideration for selection as management indicators the priority species identified for the physiographic units, to emphasize in FLRMP revisions and management programs, 2) developing clear and specific FLRMP desired future condition (DFC), habitat capability objectives for the physiographic unit priority species (individual or groups of species), and the minimum level or range of habitat conditions (i.e. would include the priority habitats) needed to sustain the identified objectives, 3) develop annual programs and budgets to implement this strategy (though the FLRMP) that will move the Forest toward the DFC/objectives and provide for the identified monitoring programs, 4) implementing the FLRMP at the project level on the Districts, 5) incorporating the regional monitoring strategy to monitor the Forest's success in achieving/sustaining FLRMP DFC/objectives and to contribute to the larger scale efforts of the Region and states in tracking the status of priority forest bird species (See Monitoring Strategy Section), and 6) maintain population/habitat data in the FWR Resources Inventory, Tracking, and Analysis Applications (RITAA) (See Regional Database Management Section).

Forest Plan Revisions

A key part of this Strategy are the decisions made in the individual Forest Plan Revisions. This Strategy makes no decisions related to forest land and resource management allocations. These decisions are made through the land management planning process as prescribed in the National Forest Management Act implementing regulations (36 CFR 219) and by following the procedural guidelines of NEPA which are presented in the CEQ Regulations (40 CFR 1500). This Strategy is designed to provide the priority species and their associated habitats that the Forests could consider for emphasis in their respective Forest Plans. The Strategy provides the perspective of how each Forest fits into their physiographic unit and into the Southeast related to conserving the identified birds. The information provided in this strategy will fit well with future subregional assessments conducted prior to Forest Plan revisions. The decisions made through the Forest Plan revisions will ultimately feed and determine the overall physiographic unit and Regional objectives for the Southern National Forests. This section identifies the steps that can be followed by the Forests during FLRMP revisions that contributes to the implementation of this strategy (See Figure 1). An example of incorporating the priority landbirds into FLRMP is provided in Appendix B. Additional guidance for incorporating this Strategy into FLRMP and management programs are provided in Regional Guidelines for Incorporating Wildlife, Fisheries, and Botanical Resources into Forest Land and Resource Management Plan Revisions (Gaines, 1993).

The Southern Appalachian Assessment (Southern Appalachian Man and the Biosphere 1996) provides the latest example for taking the guidance provided in this Strategy and conducting analysis for current landscape habitat conditions for 47 high priority bird species in this region. These species were organized into 9 groups based on habitat association. These associations included species associated with area sensitive deciduous forests, general high elevation forests, species associated with spruce-fir/northern hardwood forests, early successional habitats, riparian habitats, and high elevation mountain bald habitats. Habitat suitability for each of the groups of species was estimated. The information was sorted by national forest, as well as for the Southern Appalachians as a whole. National forests can now use this information in developing management direction in their upcoming plan revisions.

Steps to Incorporating the Regional Strategy into FLRMP

Multiple Forest Coordination. A key activity will be the coordination among the different National Forests within common physiographic units to insure that there is consistency in selecting the priority species (individual species or species groups as management indicators) and the associated habitat parameters for emphasis in forest planning and plan implementation. Subregional assessments provide an excellent opportunty accomplish this coordination. The priority species for the physiographic units and their associated habitats are shown in Tables 3 through 12. The source for developing the priority species lists are Hunter et al. (1992a) and Hunter (unpublished). Habitat information was derived from Hamel (1992). The habitat information is general at best. For instance the ages provided for mid and late successional habitats should not be used as absolutes. In most cases, the ages will be vary by forest type. It is expected that for many of the hardwood types, the ages for late successional habitats would be greater than the age shown in tables 3 through 12. More detailed species/habitat relationships and models should be developed between the Forests, with outside partners and experts consulted. This information will be used for estimating habitat capability in the development of objectives and in estimating the effects of various management activities. This coordination needs to occur early in the FLRMP revision process and continue on a regular basis throughout FLRMP implementation.

Determine Existing Conditions. Determine the existing habitat conditions (stated in acres and displayed spatially) for the identified habitat parameters, the estimated spatial distribution of the priority bird species habitat, and the estimated existing habitat capability (acres of suitable habitat) for the bird species and species groups identified as management indicators. The existing habitat condition information can be obtained using the CISC data (existing forest cover and additional parameters) in combination with the Ecological Classification Mapping Unit information. The priority bird species habitat distribution can be analyzed and displayed using by developing local spatial habitat suitability models (SAMAB 1996) or BIRDHAB. The habitat capability for the priority species will be

estimated using available habitat capability models that will be based on the physiographic unit coefficients.

Determine the Objectives for the Priority Species. The Forest Planning Team determines specific and clear objectives for the priority species and their habitats in the Forest Plan revisions.

The Forest team determines the objectives (i.e. desired levels) for sustaining the identified habitats and habitat capabilities for the priority birds, by looking at the existing forest conditions, looking at the land potential (capability) based on the physiographic units of the Forest, and the Forest's role in the "big picture". The desired levels for the different mix of habitats should be planned and spatially arranged in a fashion that complements sustaining habitat capabilities of different priority species needing different habitat parameters.

To address long term direction with no time frames, clear DFC statements should be developed to describe the appropriate habitat conditions to be sustained for the priority bird species. There can be some quantification of acres for these desired conditions. In addition quantifiable long term objectives for the priority birds can be described for the future forest.

To address short term direction (usually the life of the Forest Plan), clear quantifiable objectives should be developed to describe the desired habitat conditions and capability levels for the priority birds. These Forest Plan objectives are key to the Forest Program, as well as the overall Regional Strategy because:

- The resulting Forest wildlife/ecosystem management programs point toward achieving these objectives.
- Project level planning should tier toward achieving these objectives.
- The objectives will be the basic measuring stick for assessing success when analyzing bird monitoring results.
- The priority bird habitat and habitat capability objectives for the physiographic units and the Southern Region will result from the cumulative objectives from the individual Forest Plans.

Determine the Management Requirements. The Forest team determines the minimum management requirements (standards, guidelines) and where these requirements will be applied (forest-wide, management area) in order to move the Forest toward meeting the identified objectives. These management requirements are needed to tie the activities at the project level to achieving the Forest Plan DFC/objectives, that will in turn build the physiographic unit and Regional objectives. The individual District projects will need to recognize these relationships and design/justify projects to contribute to the overall Regional/Forest objectives.

Management Programs

Forests should tie and communicate how the ongoing and new management program activities (including habitat improvements and monitoring), the budgets, the program accomplishments, and the monitoring results (forest bird and habitat status) are contributing to the overall accomplishment of the Forest, physiographic unit, and Regional objectives. To successfully implement this strategy, the Forests may need to implement a variety of management strategies ranging from habitat protection to intensive habitat manipulation (i.e. prescribed burning, herbicide mid story treatments, community restoration). Also, the Forests should budget and make plans to implement the monitoring programs identified in this Strategy.

Monitoring Program

An important part of the overall Strategy is the landbird monitoring program (See Figure 1). Simply put, the monitoring program will allow the Southern National Forests to assess and track the status of forest breeding bird populations and their habitats at different hierarchical levels over time. The priority species identified in the Strategy will require different monitoring techniques and intensities depending on their status, habits, seasonal occurrence and information needs. However, the majority of the species will be monitored using point count techniques, supplemented with spot mapping techniques. Many factors such as storms, droughts, floods, fires, and disease, and the quality of habitats used during migration and on the wintering grounds, potentially affect bird populations (Finch 1991). These factors in addition to the breeding point counts should be considered when interpreting the monitoring. information

The Southern Region monitoring program will fit within the hierarchical monitoring framework as described by Manley, et al, 1993. The framework consists of three intensity levels for monitoring: 1) Level 1 entails monitoring population trends; 2) Level 2 evaluates habitat relationships or management effects; 3) Level 3 monitors species' demographics and associated environmental factors. The hierarchical framework defines monitoring options that build on one another (i.e. Level 2 monitoring can include Level 1 monitoring).

The Southern Region will implement at a minimum a Level 2 program that will monitor population trends and evaluate habitat relationships/management effects for all priority bird species listed (Tables 2 thru 12). In addition, a Level 3 monitoring intensity will be required for some federally threatened and endangered species and to address some questions requiring Research involvement (i.e. relationship of forest landscape patterns to bird population productivity). While Level 3 monitoring is not required for many priority species, this is no way precludes individual Forests from participating in or incorporating Level 3 monitoring into their programs (i.e. cooperative MAPS stations). In addition, some Forests are actively involved in Level 1 monitoring (i.e. BBS routes) and they are encouraged to continue in these efforts.

The monitoring program will include monitoring goals, monitoring questions, population and habitat monitoring methods and design, and regional/physiographic unit trigger points. The priorities for monitoring will be the priority species and habitats identified at the regional level and the physiographic unit level. It is recognized that this strategy will provide monitoring information for most forest birds.

Monitoring Goals and Objectives

The Guidelines for Monitoring Populations of Neotropical Migratory Birds on National Forest System Lands (Manley, et al, 1993) lists four primary goals for monitoring NTMBs:

1) to build an understanding of the influence of habitat changes resulting from Forest Service management activities on NTMBs;

2) provide insights into the temporal dynamics and trends of local and regional populations of selected NTMB species;

3) provide some clues as to the causes of trends; and

4) contribute to national and international Partners in Flight Monitoring efforts.

The Southern Region monitoring program fits within the umbrella of these National goals.

Regional Inventory and Monitoring Goals

The goals of the Southern Region's monitoring program are to:

1. Establish standardized protocol for monitoring NTMB and other forest birds on the National Forests in the Southern Region.

2. Develop a system that will measure the success in achieving population and habitat objectives at the District, Forest, and Regional level (i.e. provides implementation, effectiveness, and validation monitoring for FLRMP).

3. Obtain and manage information that will contribute to the overall understanding of the trends and status of forest birds and their habitats in the South.

4. Standardize and develop a data and information management system related to this strategy that will be used by different levels of the USFS organization, as well as other federal and state agencies, organizations, and researchers, important to regional and national monitoring/research efforts.

5. Improve the existing knowledge regarding the effects of different management activities and disturbance factors on forest bird populations.

6. Take full advantage of and continue participation in existing monitoring activities, such as BBS routes, when implementing this monitoring program.

Monitoring Questions and Hypotheses

Region-wide

1. Does the distribution and relative abundance of the breeding priority bird species and other individual bird species vary annually on the National Forests in the Southern Region?

In answering this question, the Forest Service will contribute significantly to population trend information for the Southeast and specifically address the trends on the National Forests in the Region. This information will also be used at the National or multi-regional scale to address population trend information. Long-term monitoring (i.e., greater that 10 years in duration) is required to answer this question.

Ho: The distribution and abundance of breeding bird species with portions of their range on National Forest System lands does not change from year to year within the breeding season.

2. Do the trends for the relative abundance of the breeding priority species and other individual bird species vary annually, between physiographic units, for National Forests in the Southern Region?

This information will be useful in comparing differences in population trends between physiographic units for National Forest System land. Long-term monitoring (i.e., greater that 10 years in duration) is required to answer this question.

Ho: The population trends for individual bird species does not differ between physiographic units from year to year within the breeding season.

3. Does the distribution and abundance of the identified priority habitats and other key habitats change over time on the National Forests in the Southern Region?

The Forest Service will track the acres of the priority habitats and where these habitats occur (i.e. physiographic units). This information will contribute to understanding the overall status of these habitats in the Southeast and specifically

address the trends on National Forest System land. In addition, certain successional components (i.e. early successional habitats) will be tracked. This information will be useful for looking at long-term trends, as well as comparing year to year changes.

Ho: The distribution and abundance of the identified priority habitats and other key habitats does not change over time on the National Forests in the Southern Region.

4. Does the distribution and abundance of the priority habitats and other key habitats change over time for National Forests, between physiographic units, for the Southern Region?

Ho: The distribution and abundance of the priority habitats and other key habitats does not differ over time between physiographic units for National Forest System land.

5. Is there a correlation between trends in priority bird species and other bird species during the breeding season, and the trends of the priority habitats and other key habitats for the National Forests in the Southern Region.?

Ho: Population trends are independent of habitat trends for the National Forests in the Southern Region.

6. Is there a correlation between trends in the priority bird species and other bird species during the breeding season, and the trends of the priority habitats and other key habitats, between physiographic units, for the National Forests in the Southern Region.?

Ho: There is no correlation between population trends and habitat trends between physiographic units, for the National Forests in the Southern Region.

7. Are the estimates of the priority habitats and other key habitat components equal to, greater than, or moving toward the Southern Region habitat objectives (based on the cumulative totals and desired trends of the Forest Plans)?

This will require a straight comparison of Regional cumulative totals for the identified priority habitats and other key habitats to the short and long term Regional habitat objectives. No null hypothesis is identified for this monitoring question.

8. Is the habitat capability (expressed as acres of suitable habitat and /or breeding pairs) of the individual priority bird species and other bird species equal to, greater than, or moving towards the Southern Region's habitat capability objectives (based on the cumulative totals and desired trends of the Forest Plans)?

This will require a straight comparison of Regional cumulative totals for the identified habitat groups and the short and long term Regional habitat objectives. No null hypothesis is identified for this monitoring question.

This will require a straight comparison of Regional cumulative totals for the identified priority species and the short and long term Regional habitat capability objectives. No null hypothesis is identified for this monitoring question.

9. Does the relative abundance of the priority bird species and other individual bird species differ between the identified habitat groups?

This will require stratification of the points by habitat group based on the vegetative sampling conducted on the points. The habitat groups represented will be determined based on the major habitat groups and successional classes. These will be determined by forests within physiographic units.

Ho: The relative abundance of bird species do not differ between habitat groups, including successional habitats.

Physiographic Units

1. Does the distribution and relative abundance of the breeding priority bird species and other individual bird species vary annually within individual physiographic units?

In answering this question, the Forest Service will contribute significantly to population trend information for the Partners in Flight Physiographic Working Groups and specifically address the trends on the National Forests within the physiographic areas. This information will also be used at the physiographic area or Multi-state scale to address population trend information. Long-term monitoring (i.e., greater that 10 years in duration) is required to answer this question.

Ho: The distribution and abundance of breeding bird species with portions of their range on National Forest System lands does not change from year to year within the breeding season.

2. Does the distribution and relative abundance of the breeding priority bird species and other individual bird species vary annually between National Forests within the individual physiographic units.?

Ho: The population trends for individual bird species does not differ between National Forest within individual physiographic units from year to year within the breeding season.

3. Does the distribution and abundance of the identified priority habitats and other key habitats change over time on the National Forests within individual physiographic units?

The Forest Service will track the acres of the priority habitats and where these habitats occur (i.e. physiographic units). This information will contribute to understanding the overall status of these habitats in the Partners in Flight Physiographic Working Groups and specifically address the trends on National Forest System land. In addition, certain successional components (i.e. early successional habitats) will be tracked. This information will be useful for looking at long term trends, as well as comparing year to year changes.

Ho: The distribution and abundance of the identified priority habitats and other key habitats does not change over time on the National Forests in the Southern Region.

4. Does the distribution and abundance of the priority habitats and other key habitats change over time for National Forests within individual physiographic units.?

Ho: The trends in distribution and abundance of the priority habitats and other key habitats does not differ over time between National Forests within a physiographic unit.

5. Is there a correlation between trends in priority bird species and other bird species during the breeding season, and the trends of the priority habitats and other key habitats for individual physiographic units?

Ho: There is no correlation between population trends and habitat trends for the National Forests within individual physiographic units.

6. Is there a correlation between trends in the priority bird species and other bird species during the breeding season, and the trends of the priority habitats and other key habitats, between the National Forests for individual physiographic units?

Ho: There is no correlation between population trends and habitat trends between the National Forests for individual physiographic units.

7. Within physiographic units, are the acres of the priority habitats and other key habitat components equal to, greater than, or moving toward the individual physiographic unit's habitat objectives (based on the cumulative totals and desired trends of the Forest Plans within the physiographic unit)?

This will require a straight comparison of physiographic unit cumulative totals for the identified habitat groups and the short and long term physiographic unit habitat objectives. No null hypothesis is identified for this monitoring question.

8. Is the habitat capability (expressed as acres of suitable habitat and/or breeding pairs) of the individual priority bird species and other bird species equal to, greater than, or moving toward the individual physiographic unit's habitat objectives (based on the cumulative totals and desired trends of the Forest Plans within the physiographic unit)?

This will require a straight comparison of physiographic unit cumulative totals for the identified habitat groups and the short and long term physiographic unit habitat objectives. No null hypothesis is identified for this monitoring question.

9. What are the mean breeding densities of the priority birds and other bird species for each identified habitat group within physiographic units or ,where appropriate, multiple physiographic units (i.e. Wood Thrush breeding densities in oak/hickory, >30 years old, for all coastal plain physiographic units)?

The estimates of mean breeding densities across years will be stratified by the major habitat groups and used to validate habitat capability model coefficients. These habitat capability models will be used to quantify estimates of habitat capability for birds (expressed as breeding pairs) for use in project planning, environmental assessments, and monitoring habitat capability.

Ho: There is no significant difference (at the .75 confidence level) for breeding densities, averaged across years, of individual birds, between spot mapping plots, of like habitat groups within a breeding season.

10. Does the relative abundance of the priority bird species and other individual bird species differ between the identified habitat groups within the physiographic units?

This will require stratification of the points by habitat group based on the vegetative sampling conducted on the points. The habitat groups represented will be determined based on the major habitat groups and successional classes. These will be determined by forests within physiographic units.

Ho: The relative abundance of bird species do not differ between habitat groups, including successional habitats, within the physiographic units.

Monitoring Standards for All Point Counts

The standards adopted by the Southern National Forests are based on the methods described by Ralph et al., (1993), Manley et al., (1993), Smith et al. (1993), Hamel et al., (In Draft), and Eddie Morris (pers. comm.). Appendix C contains the implementation schedule, estimated funding, and estimated work force needs for the monitoring program. Appendix D contains the standardized data forms, data entry forms, and American Ornithologists' Union (AOU) bird codes that will be used throughout the Region. In October, 1994 a Monitoring Techniques Group, made up of Forest representatives,

reviewed the monitoring standards and made recommendations. These recommendations are incorporated.

1. Selection of Point Locations. How the locations of the points are determined is based on the monitoring goals and what monitoring questions are being asked related to this Strategy (Table 13). An important consideration is balancing the need to design a statistically sound monitoring scheme and one that can realistically be implemented. To achieve this balance the following will be considered when designing the monitoring scheme:

- The points will need to be accessible. For this reason, do not include Forest stands that are located greater than one mile from roads easily accessible by vehicle in all weather situations.

- The locations of the points need to facilitate sampling multiple points each day. To do this, exclude isolated forest tracts that would require excessive travel time to the tract. This does not mean to exclude small tracts of National Forest ownership, just those that are distant.

Once the above considerations have been made the points will be located using a **stratified random design**. The points will be stratified according to habitat groups that are agreed to by all the National Forests within a physiographic unit. A minimum of 30 points will be placed within each habitat group across the physiographic unit. physiographic units with several National Forests may need a larger number of points to answer questions related to individual forests (Appendix C). The information from these point counts will be used to monitor relative abundance and long-term population trends (using weighted means) and to look at habitat relationships. The point locations will receive no special protection. The points should be considered permanent. However, to account for changing vegetative conditions (i.e. grass/shrub habitats growing to saplings) points may have to be relocated periodically to maintain the monitoring design.

Once the compartment/stands have been selected to have a point, place the point within the stand so that the entire 50 meters of the point area will be within the stand boundary. Points can be located on level D roads, closed logging roads, trails... (i.e. travel ways where the forest canopy isn't broken), to aid in traveling to and locating the points. However, the points should not be located on roads that would be considered a break in a continuous forest canopy or that would influence or disrupt the point.

2. Sample sizes. The initial number of point stations for the physiographic units and each Forest are shown in Appendix C. The number of points were estimated considering the number of habitat groups that may be identified and the need to address question specific to a National Forest. In some cases, such the Delta NF, St. Francis NF, Ocala NF, LBJ NG, and the Caddo NG, supplemental points may have to be added to address PIF physiographic monitoring efforts that are special to these areas. Sample size requirements for each effort will be calculated using the first year data to determine sample sizes that

will yield the desired level of confidence. A biometrician will be consulted when calculating minimum sample sizes or when making inferences about minimum sample sizes using local data sources. Also see Hamel et al. (In Draft) for methods in determining sample size.

3. Distance between points. A distance of 250 meters (820 feet) will be the minimum distance between points (Ralph et al., 1993)

4. Permanent stations. All counting stations will be marked permanently and the same stations used each year, except when there is need to relocate the point to maintain the sampling design as previously discussed. The points will be marked and numbered in the field using methods that are at the discretion of the individual forests. Where points are located in wilderness areas the method of marking should be coordinated with Recreation Program Managers. The latitude and longitude location of the point will be recorded using a Global Positioning System (GPS). The GPS unit will be used in future visits to help locate the point. The points will have a point unique location and identification number that will be tracked as a permanent wildlife feature in RITAA. This information will include the location of the points in the wildlife ARC layer and ORACLE tabular data. If Forests do not have ARC, then locations should be marked on USGS Quad maps. The tabular part of this database will be provided in 1995.

5. Bird Count duration. All point counts will be 10 minutes in duration. The count will have 3 time periods. The first 3 minutes of each count will be conducted and indicated on data sheets so data can be compared to BBS data. The next 3 to 5 minutes will be conducted and indicated on the data sheets so that the data can compared to point counts that are 5 minutes in length. The next 5 to 10 minutes will be conducted and indicated on the data sheets so that the data can be compared to point counts that are 10 minutes in length. The Southern National Forests will use the 10 minute counts to develop trends and relative densities of birds.

6. Distance bands. There will be 3 distance bands used for censusing birds on each point. All birds seen or heard on each point will be recorded. Birds seen or heard will be recorded for distances of 0 to 25 meters (within 82 feet of point center), 25 to 50 meters (82 to 164 feet from point center), and outside 50 meters (greater than 164 feet from point center). In addition all flyovers will be recorded. The 0 to 25 meter band will be used to improve analysis of species habitat relationships, especially within narrow habitats (i.e. riparian areas). The area within 50 meters is considered an area where the detectability of species is similar enough to enable the comparison of abundance among species (Ralph et al., 1993). The different distance bands will also permit the comparison of data from other point counts utilizing different band widths.

7. Time of Day. The point counts should be conducted between sunrise to no later than 1100 hours or 1000 hours on the coastal plain forests.

8. Time of Year. The point counts will take place during the peak of the breeding season for most of the priority birds identified for a forest/physiographic unit. For the Southern Region, this period will usually occur sometime between May 1 and June 20, depending on the Forest's location in the region. Forest's should consult with local ornithologists regarding the peak breeding periods for most of the priority birds of interest to a Forest, in order to determine the start of their census periods. These peak periods should be consistently used annually. The Forests should work to complete the counts within 3 weeks from start to finish. The points will be sampled once per year.

9. Recording Bird Data. When arriving at a point, the observer should record birds flushed from within 50 meters of the point center if the bird is not seen during the count period and recorded in the appropriate space on the data form (See Appendix D). When at the point center and before beginning the count, record the Forest, District, compartment, point number, forest stand, date, time, observer name, and weather codes (for sky condition, wind, temperature).

To begin the census, orient the data form toward the north, start the clock, and begin recording all birds observed during the next 10 minutes. A bird will be recorded on the data form where first seen or heard. The birds will be recorded using the AOU four letter codes (See Appendix D.). If the bird moves during the count, the observer will record the new location of the bird and draw a line from the previous location to the new location. If a bird cannot be identified, the observer should make note of the bird, and after the 10 period is over try to make visual identification of the bird. The observer should spend no more than 10-minutes in this effort. No aids will be used during the 10 minute point count (i.e. tape recordings, mouth sounds) in an effort to see or entice birds to sing.

10. Measuring habitat variables. Habitat variables will be measured and recorded for each point. The characterization of habitat should apply to the entire 50 meter radius of the point. These variables will be measured and updated every 5 years. To implement this program, plans will be made to measure and update habitat parameters on 20 percent of the total points each year.

The non vegetative variables to be identified and recorded for each point are:

- Elevation (in feet)
- Aspect (0 to 360 degrees)
- Slope (0 to 90 percent)
- Water (present, absent, standing, flowing, fresh, brackish, salt, within point, nearer than 100 meters of point)

The Southern Region will incorporate the following minimum habitat measurements for each point. The variables for the dominant, codominant, shrub/sapling/mid story, herbaceous, and special habitat components will be estimated for the total point from the point center. The vegetative habitat variables that will be recorded for each point are:

Dominant and Codominant Canopy

1. Forest Cover (Using Forest Service CISC codes that will describe the makeup of the major tree species in the overstory).

2. Dominant Age (Using a dominant tree characteristic of the point or CISC data for the stand if thought to be reliable representation of age at the point).

3. Dominant Tree Diameter (Estimate the average diameter at breast height for the dominant canopy by estimating or measuring representative trees).

4. Dominant Tree Height (Using a clinometer estimate the average tree height for the dominant canopy for the point).

5. Total Basal Area (Total square feet / acre of dominant tree species measured from point center using prism; the basal area will be tallied and recorded separately according to the categories of conifer and hardwood; in addition hardmast tree species basal area will be recorded).

6. Percent Canopy Cover (An ocular estimate from point center of percent cover by the dominant and codominant canopy according to the following categories; 0%, 1-25%, 26-50%, 51-75%, 76-100%).

Mid story Layer (Vegetation usually between 8 feet and 30 feet height)

1. Dominate Vegetation (general categories based on ocular observations from point center that include; deciduous {i.e. dogwood/maple, oak/hickory, gum/popular, other}, coniferous {i.e. pine, hemlock; cypress, other}; evergreen {i.e. rhododendron, mountain laurel, titi, bays, other}.)

2. Percent Canopy Cover (An ocular estimate from point center of percent cover by the mid story canopy according to the following categories; 0%, 1-25%, 26-50%, 51-75%, 76-100%).

Shrub Layer (Vegetation usually between 1 1/2 feet and 8 feet in height)

1. Dominate Vegetation (general categories based on ocular observations from point center that include; deciduous trees,

deciduous shrubs, vines, coniferous {i.e. pine, hemlock; cypress, other}; evergreen {i.e. rhododendron, mountain laurel, bays, switchcane, other}).

2. Percent Canopy Cover (An ocular estimate from point center of percent cover by the shrub layer according to the following categories; 0%, 1-25%, 26-50%, 51-75%, 76-100%).

Herbaceous Layer (Vegetation usually below 1 1/2 feet in height)

1. Dominate Vegetation (general categories based on ocular observations from point center that include; woody, forbs/sedges, grasses).

2. Percent Canopy Cover (An ocular estimate from point center of percent cover by the shrub layer according to the following categories; 0%, 1-25%, 26-50%, 51-75%, 76-100%).

3. Ground Description (An ocular estimate from point center of the following categories; litter, open glade, bare ground, moist, standing water).

Other Key Habitat Components

1. Standing Snags (An ocular estimate of the total point for the following categories; number of snags greater than 20" DBH, number of snags greater than 12" DBH).

2. Live Cavity Trees (An ocular estimate of the total point for the following categories; number of cavity trees greater than 20" DBH, number of cavity trees greater than 12" DBH).

Forests may use the more intensive vegetation measuring techniques described by Hamel, et al., (In Draft) if they so desire. Local codes can be added to tract these more intensive measurements. These intensive measurements can also be used on a subset of the total points to serve as a check of how well samplers are estimating the habitat variables.

Monitoring Standards for Spot Mapping Plots

An additional monitoring technique that may be incorporated into this Strategy is spot mapping. This technique will be used primarily to improve the basis for quantifying bird habitat capability objectives and estimates. This technique is being used to determine species breeding density/habitat information that will be used in the development of

FLRMP/project level habitat capability objectives, the validation/development of coefficients for habitat capability models (i.e. HABSIM), and to improve the estimates of environmental effects in NEPA documents, and to contribute to the National Breeding Bird Census (BBC) administered by the Cornell Laboratory of Ornithology. The techniques discussed are described by the I.B.C.C., (1970) and Ralph et al. (1993).

This technique requires a high level of bird expertise to implement. Forests will need to contract or develop cooperative agreements with experienced field ornithologists/researchers to conduct this census technique.

Selection of Plot Locations. Plot locations will be determined by the Forests within a physiographic unit. These plots will be stratified by habitat types that are being emphasized in FLRMP for in the physiographic units as described in the Forest Program section of this strategy. These plots will receive special 600 land class designation. The point count locations will be the basis for the **stratified random** selection of these plots.

Number of Plots. The number of plots will be limited due to the expense of conducting this type of census method. The annual number of plots by physiographic unit and Forest are shown in Appendix C. The total number of plots may be expanded by rotating the census on a 3 year basis.

Setting Up Plots. Once the location of plot has been determined, the plots will be marked in the field. The plots should be square in shape. One corner of the square will considered the reference point for the plot. A GPS location should be obtained for this point. The points will be marked and numbered in the field using methods that are at the discretion of the individual forests. Where points are located in wilderness areas the method of marking should be coordinated with Recreation Program Managers. Within the plot, gridlines will be laid no farther than 25 meters apart or from the edge of the plot. These plots and the grids, along with visual field reference points within the plot (i.e. large tree, old home place, paths, large rocks) will be transferred to a detailed topographic map that will be used as the field data sheet (visit map) and for census data storage. If possible, the size of the plots should not be less than 20 acres in forested habitat or less than 40 acres in open, non-forested habitats.

Time of Year. The census period will occur during the peak of the breeding season for most of the priority bird species. For the Southern Region this period will be between May 1 and June 20. Forests will need to consult with local ornithologists to determine the peak period for local areas.

Time of Day. The census will be conducted between 1/2 hour before sunrise and continue no latter than 5 hours after sunrise. Additional evening census work can be conducted for species more active during dusk/evening hours.

Number of Repetitions. There will be a minimum of 8 visits to each plot during a breeding season, with 10 visits the preferred number. These visits will be evenly

distributed over the census period. To census species active at dusk or evening, conduct 2 evening visits.

Censusing and Recording Bird Data. A clean visit map is required for each visit to the plot. The grids will be walked at a moderate speed, stopping to identify and mark individual bird locations on the visit map. The direction that grids are walked should be reversed each time the plot is visited (I.B.B.C, 1970).

Monitoring for Additional Priority Species

Species specific monitoring techniques be required for some priority species in this Strategy because 1) the point count/spot mapping techniques do not monitor these species well, 2) the species require more intensive monitoring efforts, 3) the species is monitored outside the peak breeding season for most priority bird species, or 4) the species have large territories. Additional information from other monitoring efforts such as the Christmas Bird Counts, MAPS stations, and International Migratory Bird Day efforts can be utilized. Briefly below are the species and status of monitoring protocol associated with them.

Red-cockaded Woodpecker - monitoring ongoing for breeding habitat, foraging habitat, and population status (See RCW Regional Guidelines).

Southern Bald Eagle - monitoring includes repeated visits to active and inactive nest sites to determine nesting activity, breeding pairs, fledgling success (See Southern Bald Eagle Recovery Plan).

Peregrine Falcon - surveys of high potential and historic nest sites.

Saw-whet Owl - surveys include dusk road side surveys.

Florida Burrowing Owl - Special individual species surveys.

Florida Short-tailed Hawk - Special individual species surveys.

American Swallow-tailed Kite - monitoring includes documenting active nesting territories and suitable habitat, cooperative aerial surveys.

Southeastern American Kestrel - Special individual species surveys.

American Woodcock - Some information will be gathered through point counts cooperative efforts with state wildlife agencies that include roadside counts, annual bag checks .

Ruffed Grouse - Some information will be gathered through point counts, cooperative efforts with state wildlife agencies that include roadside counts, annual bag checks.

Wild Turkey - Some information will be gathered through point counts, cooperative efforts with state wildlife agencies that include roadside counts, annual bag checks.

Northern Bobwhite - Some information will be gathered through point counts cooperative efforts with state wildlife agencies that include roadside counts, annual bag checks.

Data and Information Management

Southern Region Forest Bird Database

The data and information related to regional/physiographic unit objectives for habitats and species habitat capability, status of the identified habitats and habitat capabilities, point count data, spot mapping data, BIRDHAB, HABSIM, and the tracking operational census/habitat improvement work related to forest birds will be housed in the Fisheries, Wildlife, and Range Resource Inventory, Tracking, and Analysis Applications (RITAA). This is an ORACLE relational database and is currently under development. The relationship and the conceptual bird point count data tables in RITAA are shown in Figure 2. Additional lookup tables that are not shown in Figure 2. that will include WF&B feature code, water code, sky code, wind code, observers, bird code, forest cover (already exists), % cover codes, mid story vegetation code, shrub vegetation code, herbaceous vegetation code, and ground description code. Additional tables to track the cumulative data from the Forests for the physiographic units and the Region will be added to RITAA. There will also be tables developed and distributed for the data related to spot mapping.

Additional Southern Region Bird Data Tables

Data for some of the priority bird species will require specialized data tables to track information related to population and habitat status because The following are the birds and the status of their corresponding data tables:

Red-cockaded Woodpecker - ORACLE tables will be completed and distributed in FY 1995.

Southern Bald Eagle - Data tables to be developed, with no time frame.

Florida Burrowing Owl - Data tables to be developed by the NF in Florida, with no time frame.

Florida Short-tailed Hawk - Data tables to be developed by the NF in Florida, with no time frame.

American Swallow-tailed Kite - Data tables to be developed, with no time frame.

Southeastern American Kestrel - Data tables to be developed, with no time frame.

American Woodcock - data table to be developed, with no time frame.

Ruffed Grouse - data table to be developed, with no time frame.

Wild Turkey - data table to be developed, with no time frame.

Northern Bobwhite - data table to be developed, with no time frame.

Data Management

An important part of the monitoring program is assuring that the information that is obtained is properly utilized and that the data are stored and maintained properly. The following briefly discusses the responsibilities of maintaining the information generated by this monitoring program.

The Forest Supervisor has the responsibility for inputting and maintaining the bird population and habitat data at the Forest level. The Forests will be responsible for providing the states with bird data related to statewide conservation strategies. The Regional Forester has the responsibility for inputting and maintaining the bird population and habitat data at the physiographic unit and Regional level. The Regional Forester will be responsible for providing outside agencies/organizations Southern National Forest data for areas that cross Forest boundaries.

The Forests will have the current years monitoring data input before September 30 of each year. The Region will have the current years cumulative monitoring data for the physiographic units and the Region input before December 30 of each year. Analysis of the data to test and track the identified hypothesis will be conducted and reported before February of each year.

Figure 1. The relationship of the Forest, Ecological Units, and Region in implementing the Southern National Forest Forest Bird Conservation Strategy.

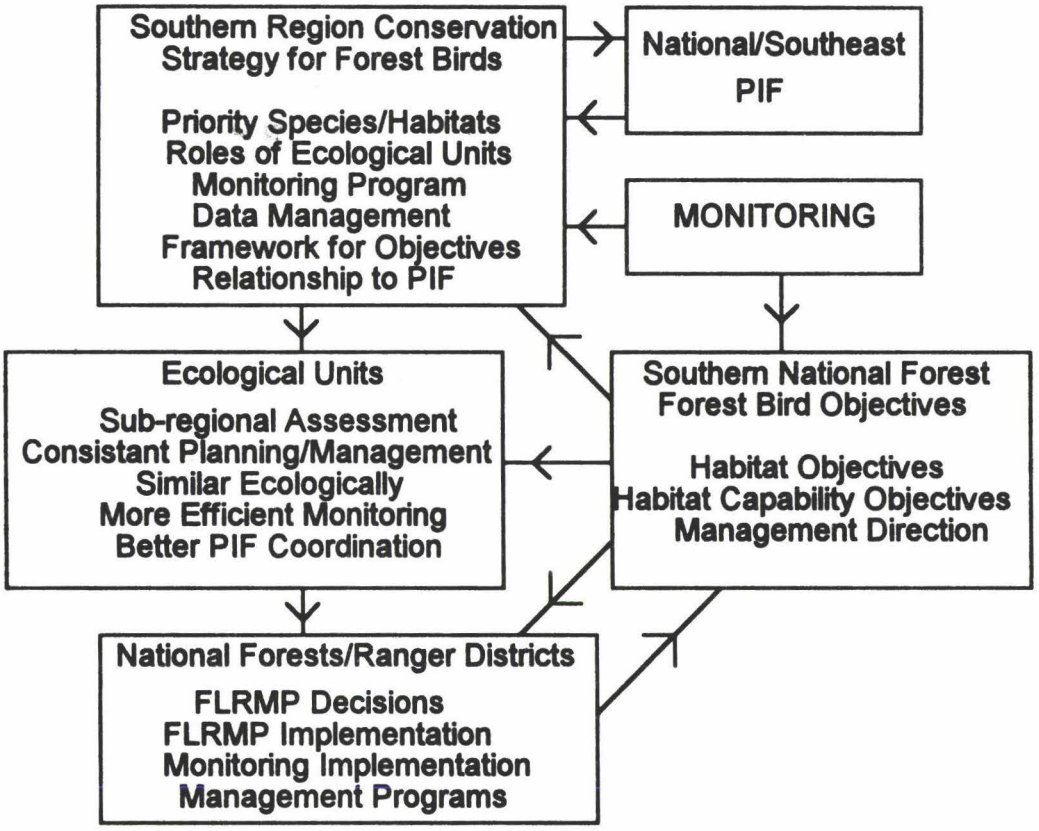
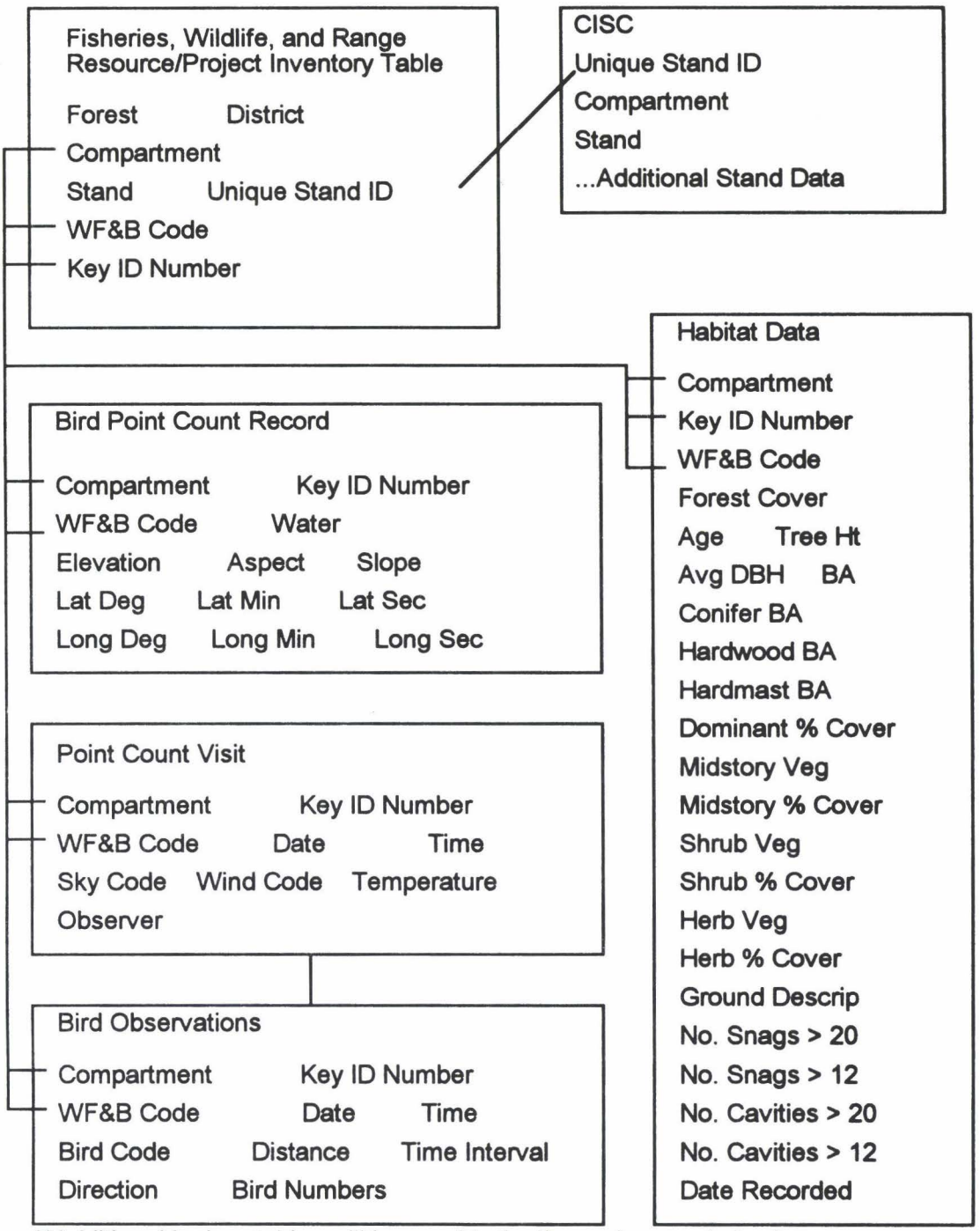


Figure 2. The probable point count monitoring data tables (from Morris, 1993) and the relationship to the Fisheries, Wildlife, and Range RITAA.



**Additional lookup tables will be provide for the various coded columns.

Table 1. The Southern Region's Physiographic Units for forest landbirds and their relationship to the National Forests and Ranger Districts.

Physiographic Unit	National Forest	Ranger District	Estimated Acres
Mid-Atlantic Ridge and Valley	Jefferson	Blacksburg Clinch New Castle Wythe	527,040
	George Washington	Deerfield Dry River James River Lee Warm Springs	954,260
Unit Acres			1,481,300
South Atlantic Coastal Plain	North Carolina	Croatan	157,850
	Francis Marion - Sumter	Witherbee Wambaw	249,870
	Florida	Apalachicola Wakulla Osceola Lake George* Seminole*	1,135,310
	Savannah River Forest Station**		194,000
Unit Acres			1,737,030

Table 1 (Continued). The Southern Region's Physiographic Units for forest landbirds and their relationship to the National Forests and Ranger Districts.

Physiographic Unit	National Forest	Ranger District	Estimated Acres
Southern Piedmont	North Carolina	Uwharrie	47,950
	Francis Marion - Sumter	Edgefield Enoree Long Cane Tyger	299,200
	Chattahootchee - Oconee	Oconee	111,060
Unit Acres			458,210
East Gulf Coastal Plain	Alabama	Tuskegee Conecuh Oakmulgie	251,300
	Mississippi	Holly Springs Tombigbee Bienville Strong River Biloxi Black Creek Chickasawhay Bude Homochitto Delta***	1,152,470
	Ozark-St. Francis	St. Francis***	21,200
Unit Acres			1,424,971

Table 1 (Continued). The Southern Region's Physiographic Units for forest landbirds and their relationship to the National Forests and Ranger Districts.

Physiographic Unit	National Forest	Ranger District	Estimated Acres
West Gulf Coastal Plain	Kisatchie	Caney Catahoula Evangeline Kisatchie Veron Winn	601,400
	Texas	Angelina Neches Trinity Tenaha Yellowpine San Jacinto Raven LBJ **** Caddo****	675,200
	Ouachita	Tiak	43,190
Total Unit			1,319,790
Northern Cumberland Plateau	Daniel Boone	Berea London Morehead Redbird Somerset Stanton Stearns	672,360
Unit Total			672,360

Table 1 (Continued). The Southern Region's Physiographic Units for forest landbirds and their relationship to the National Forests and Ranger Districts.

Physiographic Unit	National Forest	Ranger District	Estimated Acres
Southern Blue Ridge	North Carolina	Cheoah Highlands Tusquitee Wayah French Broad Grandfather Pisgah Toecane	1,027,720
	Cherokee	Hiwassee Nolichucky Ocoee Tellico Unaka Watauga	628,060
	Francis Marion - Sumter	Andrew Pickens	59,640
	Chattahoochee - Oconee	Brasstown Chestatee Cohutta Tallulah Toccoa	696,410
	George Washington	Pedlar	110,000
	Jefferson	Glenwood Mt. Rogers	180,700
Unit Total			2,702,530
West Indies	Caribbean	El Yunque	27,890

Table 1 (Continued). The Southern Region's Physiographic Units for forest landbirds and their relationship to the National Forests and Ranger Districts.

Physiographic Unit	National Forest	Ranger District	Estimated Acres
Ozark-Ouachita Interior Highlands	Ozark	Bayou Boston Mountain Buffalo Mt. Magazine Pleasant Hill Sylamore	1,123,550
	Ouachita	Caddo Cold Springs Fourche Jessieville Mena Oden Poteau Winona Womble Kiamichi Choctaw	1,605,300
Unit Total			2,728,850
Southern Cumblerand Plateau/ Ridge and Valley	Chattahoochee - Oconee	Armuchee	52,860
	Alabama	Talladega Shoal Creek Bankhead	407,460
Unit Total			460,320

* The Lake George and Seminole RD are located in the Peninsular Florida Physiographic Area, but have been placed in the South Atlantic Gulf Coastal Physiographic Unit for this Strategy.
** The Savannah River Site is administered by the Department of Energy. The USFS manages the natural resources on the Site under an Interagency Agreement.
*** The Delta and St. Francis RD actually occur in the Mississippi Alluvial Plain, but have been placed in the East Gulf Coastal Plain Physiographic Unit for this Strategy.
****The LBJ and Caddo National Grasslands are located in the Oaks and Prairies, but have been placed in the West Gulf Coastal Plain Physiographic Unit for this Strategy.

Table 2. The Southern Region's high priority breeding and wintering species list (concern scores of 24 and above) for neotropical migratory birds, temporate migratory birds, and resident birds, based on the Partners in Flight prioritization scheme for the Southeast (Hunter, et al, 1992; Hunter, unpublished) and the associated Physiographic Units.

NTMB Species	Temperate Migratory Species	Resident Species	Physiographic Units
Bachman's Warbler (Extinct?)			South Atlantic Coastal Plain East Gulf Coastal Plain West Gulf Coastal Plain
	Appalachian Bewick's Wren		Mid Atlantic Ridge and Valley Blue Ridge
		Florida Scrub Jay	South Atlantic Coastal Plain (Peninsular Florida Only)
Black-capped Vireo			West Gulf Coastal Plain (Oaks and Prairie Only)
		Red-cockaded Woodpecker	All (Except Mid Atlantic Ridge and Valley, Mississippi Alluvial Plain, Oaks and Prairie)
	Florida Burrowing Owl		South Atlantic Coastal Plain (Peninsular Florida Only)
	Eastern Bewick's Wren		Cumberland Plateau West Gulf Coastal Plain Ozark-Ouachita Highlands
Florida Short-tailed Hawk			South Atlantic Coastal Plain (Peninsular Florida Only)
Cerulean Warbler			All
South Atlantic Painted Bunting			South Atlantic Coastal Plain
	Bachman's Sparrow		All (Except Mid Atlantic Ridge and Valley, Mississippi Alluvial Valley)

Table 2. (Continued) The Southern Region's high priority breeding and wintering species list (concern scores of 24 and above) for neotropical migratory birds, temperate migratory birds, and resident birds, based on the Partners in Flight prioritization scheme for the Southeast (Hunter, et al, 1992; Hunter, unpublished) and the associated Physiographic Units.

NTMB Species	Temperate Migratory Species	Resident Species	Physiographic Units
	Henslow's Sparrow		Mid-Atlantic Ridge & Valley South Atlantic Coastal Plain, Southern Piedmont, East Gulf Coastal Plain, West Gulf Coastal Plain
	Smith's Longspur		Ozark-Ouachita Interior Highlands, West Gulf Coastal Plain
American Swallow-tailed Kite			Peninsular Florida South Atlantic Coastal Plain East Gulf Coastal Plain West Gulf Coastal Plain
Golden-winged Warbler			Blue Ridge Cumberland Plateau
Florida Prairie Warbler			South Atlantic Coastal Plain (Peninsular Florida Only)
Swainson's Warbler			All
Wayne's Black-throated Green Warbler			South Atlantic Coastal Plain
Prothonotary Warbler			All
Wood Thrush			All (Except Peninsular Florida)
Louisiana Waterthrush			All (Except Peninsular Florida)
Western Painted Bunting			East Gulf Coastal Plain West Gulf Coastal Plain Ozark-Ouchita Highlands

Table 2. (Continued) The Southern Region's high priority breeding and wintering species list (concern scores of 24 and above) for neotropical migratory birds, temperate migratory birds, and resident birds, based on the Partners in Flight prioritization scheme for the Southeast (Hunter, et al, 1992; Hunter, unpublished) and the associated Physiographic Units.

NTMB Species	Temperate Migratory Species	Resident Species	Physiographic Units
Northern Prairie Warbler			All (Except Peninsular Florida, Oaks and Prairie)
Bell's Vireo			West Gulf Coastal Plain Ozark-Ouchita Highlands
Blue-winged Warbler			All (Except South Atlantic Coastal Plain)
	Southeastern American Kestrel		South Atlantic Coastal Plain East Gulf Coastal Plain
	Field Sparrow		All
		Brown-headed Nuthatch	All (Except Mid Atlantic Coastal Plain, Blue Ridge, Mississippi Alluvial Plain, Oaks and Prairie)
	Sprague's Pipit (W)		Ozark-Ouachita Highlands, East Gulf Coastal Plain, West Gulf Coastal Plain.
	Chestnut-collared Longspur (W)		Ozark-Ouachita Highlands, West Gulf Coastal Plain.
	LeConte's Sparrow (W)		Ozark-Ouachita Highlands, East Gulf Coastal Plain, West Gulf Coastal Plain, South Atlantic Coastal Plain.
	Seaside Sparrow		South Atlantic Coastal Plain East Gulf Coastal Plain West Gulf Coastal Plain
Blackburnian Warbler			Mid Atlantic Ridge and Valley Blue Ridge
Worm-eating Warbler			All (Except Peninsular Florida, Oaks and Prairie)

Table 2. (Continued) The Southern Region's high priority breeding and wintering species list (concern scores of 24 and above) for neotropical migratory birds, temperate migratory birds, and resident birds, based on the Partners in Flight prioritization scheme for the Southeast (Hunter, et al, 1992; Hunter, unpublished) and the associated Physiographic Units.

NTMB Species	Temperate Migratory Species	Resident Species	Physiographic Units
Hooded Warbler			All (Except Peninsular Florida, Oaks and Prairie)
Mississippi Kite			South Atlantic Coastal Plain East Gulf Coastal Plain West Gulf Coastal Plain
Whip-poor Will			All (expect some portions of coastal plains and West Gulf Coastal Plain.
Chuck-wills Widow			All
	Red-headed Woodpecker		All
	Loggerhead Shrike		All
Acadian Flycatcher			All
Yellow-throated Vireo			All
Black-billed Cuckoo			Mid Atlantic Ridge and Valley
Yellow-billed Cuckoo			All
Eastern Wood Pewee			All
Great Crested Flycatcher			All
	Sedge Wren (W)		South Atlantic Coastal Plain, East Gulf Coastal Plain, West Gulf Coastal Plain.
	Harris' Sparrow (W)		West Gulf Coastal Plain, Ozark-Ouachita Highlands.

Table 2. (Continued) The Southern Region's high priority breeding and wintering species list (concern scores of 24 and above) for neotropical migratory birds, temperate migratory birds, and resident birds, based on the Partners in Flight prioritization scheme for the Southeast (Hunter, et al, 1992; Hunter, unpublished) and the associated Physiographic Units.

NTMB Species	Temperate Migratory Species	Resident Species	Physiographic Units
Kentucky Warbler			All (except Peninsular Florida, Oaks and Prairies)
Orchard Oriole			All
	American Woodcock (Score 23)		All
		Northern Bobwhite (Score 23)	All
		Ruffed Grouse (Score 18)	Mid Atlantic Ridge and Valley Blue Ridge Cumberland Plateau
		Wild Turkey (Score 18)	All

(W) Wintering Species

Table 3. The priority bird species and associated habitats for the Mid Atlantic Ridge and Valley Physiographic Unit that includes Ranger Districts from the George Washington and Jefferson National Forests.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
	Appalachian Bewick's Wren		Forest Type - Pine/hardwood, oak/hickory, maple/beech/birch. Succession - Grass/forb, shrub/sapling (0-10 years). Special - Dead/living cavities, rock outcrops, slash/windrows.
Golden-winged Warbler			Forest Type - Oak/hickory, cove hardwood, maple/beech/birch. Succession - Shrub/sapling (0-10 years). Special - Deciduous saplings.
Cerulean Warbler			Forest Type - Oak/hickory, cove hardwood. Succession - Late (greater than 60 years old). Special - Mature hardwoods with open understory, with trees greater than 20" DBH, forest interior.
Wood Thrush			Forest Type - Pine/hardwood, oak/hickory, white pine/hemlock, cove hardwood, shortleaf & loblolly pine. Succession - Mid to late (greater than 30 years old). Special - Well developed deciduous understory of shrub/sapling, closed canopy, forest interior.
Blackburnian Warbler			Forest Type - White pine/hemlock, maple/beech/birch, spruce/fir. Succession - Late (greater than 60 years old). Special - Closed canopy, mature forest with trees greater than 20" DBH, forest interior.

Table 3. (Continued) The priority bird species and associated habitats for the Mid Atlantic Ridge and Valley Physiographic Unit that includes Ranger Districts from the George Washington and Jefferson National Forests.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Worm-eating Warbler			Forest Type - Oak/hickory, cove hardwood,. Succession - Mid to late (greater than 30 years old). Special - Closed canopy, dense deciduous/broadleaf understory on steep slopes, forest interior.
	Loggerhead Shrike		Forest Type - Loblolly, shortleaf, Virginia pine, pine/hardwood. Succession - Grass/forb to late. Special - Open country, scattered trees/shrubs.
	Field Sparrow		Forest Type - Loblolly and shortleaf, Virginia pine and pitch pine, pine/hardwood, oak/hickory. Succession - Grass/forb, shrub/sapling (0-10 years).
Eastern Wood Pewee			Forest Type - Loblolly and shortleaf pine, pine/hardwood, oak/hickory. Succession - Mid to late (greater than 30 years old).
	**Henslow's Sparrow		Forest Type - Oak/hickory. Succession - Grass/forb (0-10 years). Special - Wet, grassy areas, standing water.
Prairie Warbler			Forest Type - Loblolly and shortleaf pine, pine/hardwood, oak/hickory. Succession - Shrub/sapling (0-10 years). Special - Open country, poor soil.

Table 3. (Continued) The priority bird species and associated habitats for the Mid Atlantic Ridge and Valley Physiographic Unit that includes Ranger Districts from the George Washington and Jefferson National Forests.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Louisiana Waterthrush			Forest Type - Oak/hickory, cove hardwood. Succession - Late (greater than 60 years old). Special - Deciduous forest with rocky flowing stream, forest interior.
Hooded Warbler			Forest Type - Loblolly and shortleaf pine, pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid to late (greater than 30 years old). Special - Dense deciduous understory, forest interior.
Black-billed Cuckoo			Forest Type - Oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid to late (greater than 30 years old). Special - Extensive deciduous forest, dense understory.
Whip-Poor-Will			Forest Type - Loblolly and shortleaf, Virginia pine and pitch pine, pine/hardwood, oak/hickory Succession - Mid to late. Special - Leaf litter, Upland woodlands, not far from open country.

Table 3. (Continued) The priority bird species and associated habitats for the Mid Atlantic Ridge and Valley Physiographic Unit that includes Ranger Districts from the George Washington and Jefferson National Forests.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
		Wild Turkey	Forest Type - Loblolly and shortleaf, pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid -late successional habitats with scattered early successional habitats. Special - Hard mast sources, large conifer roost trees, scattered grass/forb brooding areas, well distributed water sources, mostly open understories, woodland margins for nesting (See FSH 401).
		Northern Bobwhite	Forest Type -Loblolly and shortleaf, Virginia pine and pitch pine, pine/hardwood, oak/hickory. Succession - Interspersion of early successional habitats in mid to late successional habitats. Special - Grass/forb habitats for nesting, winter roosting cover, food, brood rearing located in early succession (0-5 years) or open, pine habitats, ~1000 acre home range. (See FSH 405)
	Northern Saw-whet Owl		Forest Type - Spruce-Fir. Succession - Mid to late. Special - Live/dead cavity at least 6-10 inches DBH, high elevation over 4000 feet.
Peregrine Falcon			Special - High Elevation cliffs.

Table 3. (Continued) The priority bird species and associated habitats for the Mid Atlantic Ridge and Valley Physiographic Unit that includes Ranger Districts from the George Washington and Jefferson National Forests.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
		Ruffed Grouse	Forest Type - White pine/hemlock, spruce/fir, pine/hardwood, oak/hickory, maple/beech/birch, cove hardwood. Succession - Interspersion of early successional habitats (0-10 years) in mid to late successional habitats Special - Dense hardwood near openings for nesting cover, drumming sites, grass/forb brood habitat. (See FSH 406.1, 406.3).
		Pileated Woodpecker	Forest Type - Pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid and late succession (greater than 30 years). Special - Large snags/live cavity (greater than 20" DBH) for nesting/roosting, distribution of habitats capable of producing large cavities/snags and foraging opportunities, forest interior.
		Northern Flicker	Forest Type - Loblolly and shortleaf, Virginia and pitch pine, pine/hardwood, oak/hickory, white pine/hemlock, cove hardwood. Succession -Grass/forb and shrub/sapling habitats (0-10 years) and mid to late successional (greater than 30 years). Special - Live cavities and snags greater than 14" DBH, open habitats or open understories.

****Peripheral species to physiographic unit.**

Table 4. The priority bird species and associated habitats for the Southern Blue Ridge Physiographic Units that includes Ranger Districts from the National Forests in North Carolina, Chattahoochee - Oconee National Forest, Cherokee National Forest, George Washington National Forest, Jefferson National Forest, and the Francis Marion - Sumter National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
	Appalachian Bewick's Wren		Forest Type - Pine/hardwood, oak/hickory, maple/beech/birch. Succession - Grass/forb, shrub/sapling (0-10 years). Special - Dead/living cavities, rock outcrops, slash/windrows.
	"Southern Appalachian" Red Crossbill		Forest Type - White pine/hemlock, spruce/fir. Succession - Mid to late (greater than 30 years). Special - Higher elevations.
		**Red-cockaded Woodpecker (Cherokee NF only)	Forest Type - Loblolly and shortleaf pine, Virginia pine. Succession - Mid to late. Special - See Regional RCW Guidelines.
Chestnut-sided Warbler			Forest Type - Pine/hardwood, oak/hickory, maple/beech/birch, cove hardwood, spruce/fir. Succession - Shrub/sapling (0-10 years). Special - Open canopy conditions, deciduous shrub/sapling, above 3,000 feet..
Swainson's Warbler			Forest Type - Cove hardwood, white pine/hemlock. Succession - Mid to late (greater than 30 years old). Special - Dense understory, usually rhododendron or mountain laurel, forest interior.

Table 4. (Continued) The priority bird species and associated habitats for the Southern Blue Ridge Physiographic Unit that includes Ranger Districts from the National Forests in North Carolina, Chattahoochee - Oconee National Forest, Cherokee National Forest, and the Francis Marion - Sumter National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Wood Thrush			Forest Type - Pine/hardwood, oak/hickory, white pine/hemlock, cove hardwood, shortleaf & loblolly pine. Succession - Mid to late (greater than 30 years old). Special - Well developed deciduous understory of shrub/sapling, closed canopy, below 5,000 feet, forest interior.
Golden-winged Warbler			Forest Type - Oak/hickory, cove hardwood, maple/beech/birch. Succession - Shrub/sapling (0-10 years). Special - Deciduous saplings.
Cerulean Warbler			Forest Type - Oak/hickory, cove hardwood. Succession - Late (greater than 60 years old). Special - Mature hardwoods with open understory, with trees greater than 20" DBH, forest interior.
Worm-eating Warbler			Forest Type - Oak/hickory, cove hardwood,. Succession - Mid to late (greater than 30 years old). Special - Closed canopy, dense deciduous/broadleaf understory on steep slopes, below 3,000 feet, forest interior.
Louisiana Waterthrush			Forest Type - Oak/hickory, cove hardwood. Succession - Late (greater than 60 years old). Special - Deciduous forest with rocky flowing stream, below 3,500 feet, forest interior.

Table 4. (Continued) The priority bird species and associated habitats for the Southern Blue Ridge Physiographic Unit that includes Ranger Districts from the National Forests in North Carolina, Chattahoochee - Oconee National Forest, Cherokee National Forest, and the Francis Marion - Sumter National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Hooded Warbler			Forest Type - Loblolly and shortleaf pine, pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid to late (greater than 30 years old). Special - Dense deciduous understory, below 4,000 feet, forest interior.
Acadian Flycatcher			Forest Type - Oak/hickory, white pine/hemlock, cove hardwood. Succession - Late (greater than 60 years old). Special - Closed canopy deciduous forest near stream, moderate understory, snags, below 3,500 feet, forest interior.
Black-throated Blue Warbler			Forest Type - Oak/hickory, cove hardwood, maple/beech/birch, spruce/fir. Succession - Mid to late (greater than 30 years old). Special - Closed canopy deciduous forest, developed understory, above 3,000 feet, forest interior
Canada Warbler			Forest Type - White Pine/hemlock, cove hardwood, maple/beech/birch, spruce/fir. Succession - Mid to late (greater than 30 years old). Special - Dense understory, prefers rhododendron or mountain laurel, above 3,500 feet.

Table 4. (Continued) The priority bird species and associated habitats for the Southern Blue Ridge Physiographic Unit that includes Ranger Districts from the National Forests in North Carolina, Chattahoochee - Oconee National Forest, Cherokee National Forest, and the Francis Marion - Sumter National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Eastern Wood Pewee			Forest Type - Loblolly and shortleaf, white pine/hemlock, cove hardwood, maple/beech/birch/, spruce/fir. Succession - Mid to late (greater than 30 years old). Special - Below 4,500 feet.
Yellow-throated Vireo			Forest Type - Oak/Hickory. Succession - Late (greater than 60 years old). Special - Deciduous, open understory, with trees greater than 20" DBH, below 2,500 feet.
Black-throated Green Warbler			Forest Type - Pine/hardwood, white pine/hemlock, cove hardwood, maple/beech/birch, spruce/fir. Succession - Mid to late (greater than 30 years old). Special - Closed canopy, with conifers present, forest interior.
Prairie Warbler			Forest Type - Loblolly and shortleaf pine, pine/hardwood, oak/hickory. Succession - Shrub/sapling. Special - Open country, poor soil.
Blackburnian Warbler			Forest Type - White pine/hemlock, maple/beech/birch, spruce/fir. Succession - Late (greater than 60 years old). Special - Closed canopy, mature forest with trees greater than 20" DBH, above 3,500 feet, forest interior.

Table 4. (Continued) The priority bird species and associated habitats for the Southern Blue Ridge Physiographic Unit that includes Ranger Districts from the National Forests in North Carolina, Chattahoochee - Oconee National Forest, Cherokee National Forest, and the Francis Marion - Sumter National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Kentucky Warbler			Forest Type - Oak/hickory. Succession - Mid to late (greater than 30 years). Special - Lower elevations, heavy understory, below 3,500 feet, forest interior.
Scarlet Tanager			Forest Type - Pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Late (greater than 60 years). Special - Below 5,000 feet, forest interior.
	Bachman's Sparrow (extreme southern portion of Physiographic Unit)		Forest Type - Loblolly and shortleaf pine, pine/hardwood. Succession - Grass/forb, shrub/sapling (0-10 years).
	Field Sparrow		Forest Type - Loblolly and shortleaf pine, pine/hardwood, oak/hickory. Succession - Shrub/sapling. Special - Open country, poor soil, below 3,500 feet.
Ovenbird			Forest Type - Pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid to late (greater than 30 years). Special - Below 5,000 feet, forest interior.
	Northern Saw-whet Owl		Forest Type - Spruce-Fir. Succession - Mid to late. Special - Live/dead cavity at least 6-10 inches DBH, high elevation over 4000 feet.

Table 4. (Continued) The priority bird species and associated habitats for the Southern Blue Ridge Physiographic Unit that includes Ranger Districts from the National Forests in North Carolina, Chattahoochee - Oconee National Forest, Cherokee National Forest, and the Francis Marion - Sumter National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
		Wild Turkey	Forest Type - Loblolly and shortleaf, pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid -late successional habitats with scattered early successional habitats. Special - Hard mast sources, large conifer roost trees, scattered grass/forb brooding areas, well distributed water sources, mostly open understories, woodland margins for nesting, ~1000 acre home range. (See FSH 401).
		Northern Bobwhite	Forest Type -Loblolly and shortleaf, Virginia pine and pitch pine, pine/hardwood, oak/hickory. Succession - Interspersion of early successional habitats in mid to late successional habitats. Special - Grass/forb habitats for nesting, winter roosting cover, food, brood rearing located in early succession (0-5 years) or open, pine habitats. (See FSH 405)

Table 4. (Continued) The priority bird species and associated habitats for the Southern Blue Ridge Physiographic Unit that includes Ranger Districts from the National Forests in North Carolina, Chattahoochee - Oconee National Forest, Cherokee National Forest, and the Francis Marion - Sumter National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
		Ruffed Grouse	Forest Type - White pine/hemlock, spruce/fir, pine/hardwood, oak/hickory, maple/beech/birch, cove hardwood. Succession - Interspersion of early successional habitats (0-10 years) in mid to late successional habitats Special - Dense hardwood near openings for nesting cover, drumming sites, grass/forb brood habitat. (See FSH 406.1, 406.3).
		Pileated Woodpecker	Forest Type - Pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid and late succession (greater than 30 years). Special - Large snags/live cavity (greater than 20" DBH) for nesting/roosting, distribution of habitats capable of producing large cavities/snags and foraging opportunities, below 4,500 feet, forest interior.

Table 4. (Continued) The priority bird species and associated habitats for the Southern Blue Ridge Physiographic Unit that includes Ranger Districts from the National Forests in North Carolina, Chattahoochee - Oconee National Forest, Cherokee National Forest, and the Francis Marion - Sumter National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Peregrine Falcon			Special - High Elevation cliffs.
		Northern Flicker	Forest Type - Loblolly and shortleaf, Virginia and pitch pine, pine/hardwood, oak/hickory, white pine/hemlock, cove hardwood. Succession -Grass/forb and shrub/sapling habitats (0-10 years) and mid to late successional (greater than 30 years). Special - Live cavities and snags greater than 14" DBH, open habitats or open understories, below 5,000.

****Peripheral species to Physiographic Unit.**

Table 5. The priority bird species and associated habitats for the South Atlantic Coastal Plain Physiographic Unit that includes Ranger Districts from the National Forests in North Carolina, Francis Marion - Sumter National Forest, National Forests in Florida (including Peninsular Florida), and the Savannah River Forest Station.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
		Red-cockaded Woodpecker	Forest Type - Pine Savannah, longleaf/scrub oak, sandhills longleaf, longleaf and slash pine. Succession - Mid and late. Special - See Regional RCW Guidelines.
		Florida Scrub Jay (Peninsular Florida)	Forest Type - Southern scrub oak, sand pine/southern scrub oak, longleaf/scrub oak, live oak/maritime. Succession - Shrub/sapling and mid succession. Special - Oaks of saplings or pole timber size in sandy soil.
		Florida Grasshopper Sparrow (Peninsular Florida)	Forest Type - Pine Savannah. Succession - Grass/forb. Special - Fields with vegetation approximately 1' high.
	Florida Burrowing Owl (Peninsular Florida)		Forest Type - Pine savanna, southern scrub oak. Succession - Grass/forb. Special - Short grass habitats with sandy soils.
"South Atlantic Coast" Painted Bunting (FL, SC)			Forest Type - Southern scrub oak, live oak/maritime. Succession - Shrub sapling to mid succession. Special - Dense shrub, sapling, or pole timber.
Florida Short-tailed Hawk Peninsular Florida)			Forest Type - Oak/gum/cypress. Succession - Mid to late (greater than 30 years). Special - Overstory for nesting.

Table 5 (Continued). The priority bird species and associated habitats for the South Atlantic Coastal Plain Physiographic Unit that includes Ranger Districts from the National Forests in North Carolina, Francis Marion - Sumter National Forest, National Forests in Florida (including Peninsular Florida), and the Savannah River Forest Station.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
	Bachman's Sparrow		Forest Type - Pine savanna, longleaf/scrub oak, sandhills longleaf, longleaf, slash, and loblolly pine, pine/hardwood. Succession - Grass/forb to late. Special - Open canopy pine, containing thick herbaceous cover.
		Florida Sandhill Crane (FL)	Forest Type - Pine savanna. Succession - Grass/forb to late. Special - Open pine savannas with associated standing water.
"Wayne's" Black-throated Green Warbler (NC, SC)			Forest Type - Pond pine pocosin, oak/gum/cypress, elm/ash/cottonwood, pine/hardwood. Succession - Mid to late (greater than 30 years old). Special - Closed canopy, forest interior.
	Southeastern American Kestrel (FL)		Forest Type - Pine savanna. Succession - All. Special - Extensive open country (including power ROW, upland pine with basal areas less than 30), with snags greater than 14" DBH.
		Brown-headed Nuthatch	Forest Type - Pine savanna, sand pine/scrub oak, longleaf pine/scrub oak, sandhill longleaf, pond pine pocosin, longleaf, slash, and loblolly pine. Succession - Mid to late. (greater than 30 years old). Special - Open pine woodlands, snags and live cavity trees.

Table 5 (Continued). The priority bird species and associated habitats for the South Atlantic Coastal Plain Physiographic Unit that includes Ranger Districts from the National Forests in North Carolina, Francis Marion - Sumter National Forest, National Forests in Florida (including Peninsular Florida), and the Savannah River Forest Station.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Swainson's Warbler			Forest Type - Mixed mesic hardwoods, bay swamp/pocosin, oak/gum/cypress, elm/ash/cottonwood. Succession - Mid to late (greater than 30 years old). Special - Dense understory, usually damp forests with cane thickets.
American Swallow-tailed Kite			Forest Type - Pine savanna, pine/hardwood, loblolly pine, oak/gum/cypress, elm/ash/cottonwood. Succession - Late (greater than 60 years old), Special - Large trees (especially pine) greater than 20" DBH in or near swamps.
Wood Thrush			Forest Type - Mixed mesic hardwoods, oak/gum/cypress, elm/ash/cottonwood, loblolly pine, pine/hardwood, oak/hickory. Succession - Mid to late (greater than 30 years old). Special - Well developed deciduous understory of shrub/sapling, closed canopy, forest interior.
Prairie Warbler			Forest Type - Longleaf/scrub oak, mixed mesic hardwoods, bay swamp/pocosins, pond pine pocosin, live oak/maritime, longleaf and loblolly pine. Succession - Shrub/sapling, mid, or late. Special - Open country, poor soil, upland open, pine habitats with shrub/sapling component.

Table 5 (Continued). The priority bird species and associated habitats for the South Atlantic Coastal Plain Physiographic Unit that includes Ranger Districts from the National Forests in North Carolina, Francis Marion - Sumter National Forest, National Forests in Florida (including Peninsular Florida), and the Savannah River Forest Station.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Hooded Warbler			Forest Type - Mixed mesic hardwood, bay swamp/pocosin, oak/gum/cypress, elm/ash/cottonwood, loblolly, pine/hardwood. Succession - Mid to late (greater than 30 years old). Special - Dense deciduous understory, forest interior.
Great-crested Flycatcher			Forest Type - Longleaf/scrub oak, longleaf sandhills, mixed mesic hardwood, bay swamp/pocosin, pond pine pocosin, longleaf, slash, and loblolly pine, oak/gum/cypress, live oak/maritime, elm/ash/cottonwood, pine/hardwood. Succession - Mid to late (greater than 30 years old). Special - Open woods, snags and live cavities greater than 10" DBH for nesting.
	Bald Eagle		Forest Type - Pine savanna, oak/gum/cypress, loblolly pine. Succession - Late (greater than 60 years old). Special - Large trees for nesting (greater than 20" DBH), near open water.
	Loggerhead Shrike		Forest Type - Pine savanna. Succession - Grass/forb to late. Special - Open country, scattered trees/shrubs.

Table 5 (Continued). The priority bird species and associated habitats for the South Atlantic Coastal Plain Physiographic Unit that includes Ranger Districts from the National Forests in North Carolina, Francis Marion - Sumter National Forest, National Forests in Florida (including Peninsular Florida), and the Savannah River Forest Station.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Yellow-throated Warbler			Forest Type - Mixed mesic hardwood, bay swamp/pocosin, oak/gum/cypress, live oak/maritime, elm/ash/cottonwood, loblolly pine, pine/hardwood. Succession - Late (greater than 60 years old). Special - Broadleaf evergreen or bottom land forests with large trees (greater than 20" DBH).
Prothonotory Warbler			Forest Type - Bay swamp/pocosin, oak/gum/cypress, elm/ash/cottonwood. Succession - Mid to late (greater than 30 years old). Special - Swamps/bottom lands with standing water and scattered snags/stumps.
		Northern Bobwhite	Forest Type - Pine savanna, southern scrub oak, sand pine/scrub oak, longleaf, slash, and loblolly pine, sandhills longleaf, pine hardwood, oak/hickory. Succession - Grass/forb to late. Special - Grass/forb habitats for nesting, winter roosting cover, food, brood rearing located in early succession (0-5 years) or open, fire dominated pine habitats. (See FSH 405)

Table 5 (Continued). The priority bird species and associated habitats for the South Atlantic Coastal Plain Physiographic Unit that includes Ranger Districts from the National Forests in North Carolina, Francis Marion - Sumter National Forest, National Forests in Florida (including Peninsular Florida), and the Savannah River Forest Station.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
	Red-headed Woodpecker		Forest Type - Pine savanna, longleaf/scrub oak, sandhills longleaf, pond pine pocosin, longleaf, slash, and loblolly, oak/gum/cypress, oak/hickory. Succession - Grass/forb to late. Special - Open canopy, with snags (greater than 14" DBH), early succession with scattered snags.
		Wild Turkey	Forest Type - Sandhill longleaf, mixed mesic hardwood, longleaf, slash, and loblolly pine, oak/gum/cypress, live oak/maritime, pine/hardwood, oak/hickory. Succession - Mid -late successional habitats with scattered early successional habitats. Special - Hard mast sources, large conifer roost trees, scattered grass/forb brooding areas, well distributed water sources, mostly open understories, woodland margins for nesting, ~1000 acre home range. (See FSH 401).

Table 5 (Continued). The priority bird species and associated habitats for the South Atlantic Coastal Plain Physiographic Unit that includes Ranger Districts from the National Forests in North Carolina, Francis Marion - Sumter National Forest, National Forests in Florida (including Peninsular Florida), and the Savannah River Forest Station.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
		Pileated Woodpecker	Forest Type - Mixed mesic hardwood, bay swamp/pocosin, oak/gum/cypress, elm/ash/cottonwood, pine/hardwood, oak/hickory. Succession - Mid to late (greater than 30 years old). Special - Large snags/live cavity trees (greater than 20" DBH) in mostly deciduous forests, requires some late succession.
	Henslow's Sparrow (W)		Forest Type - Pine savanna, southern scrub oak, sand pine/scrub oak, longleaf, slash, and loblolly pine, sandhills longleaf, pine hardwood, oak/hickory. Succession - Grass/forb to late. Special - Grass/forb habitats for winter roosting cover and food, located in early succession (0-5 years) or open, fire dominated pine habitats.

(W) Wintering Species
****Peripheral species to physiographic unit.**

Table 6. The priority bird species and their associated habitats for the Southern Piedmont Physiographic Unit that includes Ranger Districts from the National Forests in Alabama, Chattahoochee - Oconee National Forest, National Forest in North Carolina, and the Francis Marion - Sumter National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
		Red-cockaded Woodpecker	Forest Type - Loblolly, shortleaf, and longleaf pine. Succession - Mid and late. Special - See Regional RCW Guidelines.
Wood Thrush			Forest Type - Mixed mesic hardwoods, oak/gum/cypress, elm/ash/cottonwood, shortleaf and loblolly pine, pine/hardwood, oak/hickory, cove hardwood. Succession - Mid to late (greater than 30 years old). Special - Well developed deciduous understory of shrub/sapling, closed canopy, forest interior.
Prairie Warbler			Forest Type - Loblolly, shortleaf, and longleaf pine, mixed mesic hardwoods, pine/hardwood, and oak/hickory. Succession - Shrub/sapling, mid, or late. Special - Open country, poor soil, upland open, pine habitats with shrub/sapling component.
Swainson's Warbler			Forest Type - Mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood, cove hardwood. Succession - Mid to late (greater than 30 years old). Special - Dense understory, usually mountain laurel/cane, forest interior.
Prothonotary Warbler			Forest Type - Oak/gum/cypress, elm/ash/cottonwood. Succession - Mid to late (greater than 30 years old). Special - Swamps/bottom lands with standing water and scattered snags or stumps.

Table 6 (Continued). The priority bird species and their associated habitats for the Southern Piedmont Physiographic Unit that includes Ranger Districts from the National Forests in Alabama, Chattahoochee - Oconee National Forest, National Forest in North Carolina, and the Francis Marion - Sumter National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
	Field Sparrow		Forest Type - Loblolly, shortleaf, longleaf, and Virginia pine, pine/hardwood, oak/hickory. Succession - Grass/forb, shrub/sapling (0-10 years). Special - Scattered saplings, shrubs with tall herbaceous cover.
	Bachman's Sparrow		Forest Type - Loblolly, shortleaf, and longleaf pine, pine/hardwood. Succession - Grass/forb, shrub sapling (0-10 years). Special - Dense herbaceous cover.
Yellow-billed Cuckoo			Forest Type - Mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood, oak/hickory. Succession - Mid to late (greater than 20 years old). Special - Thick/tangled vegetation.
Acadian Flycatcher			Forest Type - Mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood, oak/hickory, cove hardwood. Succession - Late (greater than 60 years old). Special - Closed canopy, deciduous forest near stream, moderate understory, snags, forest interior.
Gray Catbird			Forest Type - Mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood, cove hardwood. Succession - Shrub/sapling to late. Special - Dense shrub understory.
Whip-Poor-Will			Forest Type - Loblolly and shortleaf, Virginia pine and pitch pine, pine/hardwood, oak/hickory Succession - Mid to late. Special - Leaf litter, Upland woodlands, not far from open country.

Table 6 (Continued). The priority bird species and their associated habitats for the Southern Piedmont Physiographic Unit that includes Ranger Districts from the National Forests in Alabama, Chattahoochee - Oconee National Forest, National Forest in North Carolina, and the Francis Marion - Sumter National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
		Brown-headed Nuthatch	Forest Type - Pine savanna, sand pine/scrub oak, longleaf pine/scrub oak, sandhill longleaf, pond pine pocosin, longleaf, slash, and loblolly pine. Succession - Mid to late. (greater than 30 years old). Special - Open pine woodlands, snags and live cavity trees.
	Loggerhead Shrike		Forest Type - Pine savanna. Succession - Grass/forb to late. Special - Open country, scattered trees/shrubs.
		Northern Bobwhite	Forest Type - Loblolly, longleaf, shortleaf pine, and Virginia Pine, pine hardwood, oak/hickory. Succession - Grass/forb, shrub/sapling, to late (in Pine Forests. Special - Grass/forb habitats for nesting, winter roosting cover, food, brood rearing located in early succession (0-5 years) or open, fire dominated pine habitats. (See FSH 405)

Table 6 (Continued). The priority bird species and their associated habitats for the Southern Piedmont Physiographic Unit that includes Ranger Districts from the National Forests in Alabama, Chattahoochee - Oconee National Forest, National Forest in North Carolina, and the Francis Marion - Sumter National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
		Wild Turkey	Forest Type - Mixed mesic hardwood, Loblolly, shortleaf, and longleaf, oak/gum/cypress, pine/hardwood, oak/hickory, cove hardwood. Succession - Mid -late successional habitats with scattered early successional habitats. Special - Hard mast sources, large conifer roost trees, scattered grass/forb brooding areas, well distributed water sources, mostly open understories, woodland margins for nesting, ~1000 acre home range. (See FSH 401).
		Pileated Woodpecker	Forest Type - Mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood, pine/hardwood, oak/hickory. Succession - Mid to late (greater than 30 years old). Special - Large snags/live cavity trees (greater than 20" DBH) in mostly deciduous forests, requires some late succession.
	Red-headed Woodpecker		Forest Type - Loblolly, shortleaf, and longleaf pine, oak/gum/cypress, oak/hickory. Succession - Grass/forb to late. Special - Open canopy, with snags greater than 14" DBH, early succession with snags.

****Peripheral Species to physiographic unit.**

Table 7. The priority bird species and their associated habitats for the East Gulf Coastal Plain Physiographic Unit that includes Ranger Districts from the National Forests in Alabama and National Forests in Mississippi.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
		Mississippi Sandhill Crane	Forest Type - Pine savanna. Succession - Grass/forb to shrub/sapling. Special - Open pine savannas with associated standing water.
		Red-cockaded Woodpecker	Forest Type - Longleaf/scrub oak, longleaf, slash, and loblolly pine. Succession - Mid and late. Special - See Regional RCW Guidelines (In Draft).
Swainson's Warbler			Forest Type - Mixed mesic hardwoods, oak/gum/cypress, elm/ash/cottonwood. Succession - Mid to late (greater than 30 years old). Special - Dense understory, usually damp sites with cane thickets.
Prothonotory Warbler			Forest Type - Oak/gum/cypress, elm/ash/cottonwood. Succession - Mid to late (greater than 30 years old). Special - Swamps/bottom lands with standing water and scattered snags/stumps.
	**Eastern Bewick's Wren (MS only)		Forest Type - Loblolly pine, pine/hardwood, oak/hickory. Succession - grass/forb, shrub/sapling. Special - Snags/live cavities, shrubs/saplings (associated with agricultural settings).
		Brown-headed Nuthatch	Forest Type - Longleaf/scrub oak, longleaf, slash, and loblolly pine. Succession - Mid to late (greater than 30 years old). Special - Open pine woodlands, snags/living cavities.

Table 7 (Continued). The priority bird species and their associated habitats for the East Gulf Coastal Plain Physiographic Unit that includes Ranger Districts from the National Forests in Alabama and National Forests in Mississippi.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Mississippi Kite			Forest Type - Mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood. Succession - Mid to late (greater than 30 years old). Special - Extensive bottom land hardwoods near running/standing water, open fields/marshes to feed.
American Swallow-tailed Kite			Forest Type - Pine savanna, pine/hardwood, loblolly pine, oak/gum/cypress, elm/ash/cottonwood. Succession - Late (greater than 60 years old), Special - Large trees (especially pine) greater than 20" DBH in or near swamps.
Yellow-billed Cuckoo			Forest Type - Mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood, oak/hickory. Succession - Mid to late (greater than 20 years old). Special - Thick/tangled vegetation.
Wood Thrush			Forest Type - Mixed mesic hardwoods, oak/gum/cypress, elm/ash/cottonwood, loblolly pine, pine/hardwood, oak/hickory, cove hardwood. Succession - Mid to late (greater than 30 years old). Special - Well developed deciduous understory of shrub/sapling, closed canopy, forest interior.
White-eyed Vireo (MS Alluvial Plain only)			Forest Type - Mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood. Succession - Shrub/sapling. Special - Dense, moist thickets.

Table 7 (Continued). The priority bird species and their associated habitats for the East Gulf Coastal Plain Physiographic Unit that includes Ranger Districts from the National Forests in Alabama and National Forests in Mississippi.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Prairie Warbler (East Gulf Coastal Plain Only)			Forest Type - Longleaf/scrub oak, mixed mesic hardwood, longleaf and loblolly pine. Succession - Shrub/sapling to late. Special - Open country with poor soil, open pine woodlands with scattered shrub/sapling.
Northern Parula (MS Alluvial Plain only)			Forest Type - Mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood, pine/hardwood, oak/hickory. Succession - Mid to late (greater than 30 years old). Special - Forest interior, lichens/spanish moss for nesting material.
Cerulean Warbler (MS Alluvial Plain & northern portions of East Gulf Coastal Plain)			Forest Type - Oak/gum/cypress, elm/ash/cottonwood, oak/hickory. Succession - Late (greater than 60 years old). Special - Mature hardwood with open understory, with trees greater than 20" DBH, forest interior.
Hooded Warbler (MS Alluvial Plain only)			Forest Type - Mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood, loblolly, pine/hardwood. Succession - Mid to late (greater than 30 years old). Special - Dense deciduous understory, forest interior.
Eastern Wood Pewee (MS Alluvial Plain only)			Forest Type - Loblolly pine, pine/hardwood, elm/ash/cottonwood, mixed mesic hardwood. Succession - Mid to late (greater than 30 years old).

Table 7 (Continued). The priority bird species and their associated habitats for the East Gulf Coastal Plain Physiographic Unit that includes Ranger Districts from the National Forests in Alabama and National Forests in Mississippi.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Acadian Flycatcher (MS Alluvial Plain only)			Forest Type - Oak/hickory, mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood. Succession - Late (greater than 60 years old). Special - Closed canopy deciduous forest near stream, moderate understory, snags, forest interior.
Chuck-will's-widow			Forest Type - Mixed mesic hardwoods, loblolly pine, pine/hardwood. Succession - Mid to late (greater than 20 years old). Special - Moderate understory, near open country.
	Loggerhead Shrike		Forest Type - Pine savanna. Succession - Grass/forb to late. Special - Open country, scattered trees/shrubs, primarily associated with agricultural/farmland.
Great-crested Flycatcher			Forest Type - Mixed mesic hardwood, longleaf, slash, shortleaf , and loblolly pine, oak/gum/cypress, elm/ash/cottonwood, pine/hardwood. Succession - Mid to late (greater than 30 years old). Special - Open woods, snags and live cavities greater than 10" DBH for nesting.
	Bachman's Sparrow (East Gulf Coastal Plain Only)		Forest Type - Pine savanna, longleaf, slash, shortleaf, and loblolly pine, pine/hardwood. Succession - Grass/forb to late. Special - Open canopy pine, containing thick herbaceous cover.
	Field Sparrow		Forest Type - Loblolly, shortleaf, and longleaf, pine/hardwood, oak/hickory. Succession - Grass/forb, shrub/sapling (0-10 years). Special - Scattered saplings, shrubs with tall herbaceous cover.

Table 7 (Continued). The priority bird species and their associated habitats for the East Gulf Coastal Plain Physiographic Unit that includes Ranger Districts from the National Forests in Alabama and National Forests in Mississippi.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Painted Bunting (MS Alluvial Valley Only)			Forest Type - Bottomland hardwood, mixed pine/hardwood. Succession - Shrub/sapling to pole timber. Special - Dense thicket of shrubs.
		Northern Bobwhite	Forest Type - Pine savanna, longleaf, slash, shortleaf, and loblolly pine, pine hardwood, oak/hickory. Succession - Grass/forb to late. Special - Grass/forb habitats for nesting, winter roosting cover, food, brood rearing located in early succession (0-5 years) or open, fire dominated pine habitats. (See FSH 405)
	Red-headed Woodpecker		Forest Type - Pine savanna, longleaf, shortleaf, slash, and loblolly pine, oak/gum/cypress, oak/hickory. Succession - Grass/forb to late. Special - Open canopy, with snags (greater than 14" DBH), early succession with scattered snags.
		Wild Turkey	Forest Type - Mixed mesic hardwood, longleaf, slash, shortleaf, and loblolly pine, oak/gum/cypress, pine/hardwood, oak/hickory. Succession - Mid -late successional habitats with scattered early successional habitats. Special - Hard mast sources, large conifer roost trees, scattered grass/forb brooding areas, well distributed water sources, mostly open understories, woodland margins for nesting, ~1000 acre home range. (See FSH 401).

Table 7 (Continued). The priority bird species and their associated habitats for the East Gulf Coastal Plain Physiographic Unit that includes Ranger Districts from the National Forests in Alabama and National Forests in Mississippi.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
	American Woodcock		Forest Type - Oak/gum/cypress, elm/ash/cottonwood, pine/hardwood, oak/hickory. Succession - Mid to late. Special - Woodland thickets, bottom land forests, moderate shrub layer, abundant dead litter, standing water.
		Pileated Woodpecker	Forest Type - Mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood, pine/hardwood, oak/hickory. Succession - Mid to late (greater than 30 years old). Special - Large snags/live cavity trees (greater than 20" DBH) in mostly deciduous forests, requires some late succession.
	Henslow's Sparrow (W)		Forest Type - Pine savanna, southern scrub oak, sand pine/scrub oak, longleaf, slash, and loblolly pine, sandhills longleaf, pine hardwood, oak/hickory. Succession - Grass/forb to late. Special - Grass/forb habitats for winter roosting cover and food located in early succession (0-5 years) or open, fire dominated pine habitats.

(W) Wintering Species
****Peripheral species to physiographic unit.**

Table 8. The priority bird species and their associated habitats for the West Gulf Plain Physiographic Unit (includes the Oaks and Prairies) Ranger Districts from the Kisatchie National Forest, National Forests and Grasslands in Texas, and the Ouchita National Forests.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
		Red-cockaded Woodpecker (Coastal Plain Only)	Forest Type - Longleaf/scrub oak, longleaf, shortleaf , and loblolly pine, pine savanna. Succession - Mid and late. Special - See Regional RCW Guidelines (In Draft).
Black-capped Vireo (Oaks & Prairies Only)			Forest Type - Scrub Oak. Special - Dry hillsides, ravines.
Prothonotary Warbler (Coastal Plain Only)			Forest Type - Oak/gum/cypress, elm/ash/cottonwood. Succession - Mid to late (greater than 30 years old). Special - Swamps/bottom lands with standing water and scattered snags/stumps
Swainson's Warbler (Coastal Plain Only)			Forest Type - Mixed mesic hardwoods, oak/gum/cypress, elm/ash/cottonwood. Succession - Mid to late (greater than 30 years old). Special - Dense understory, usually damp sites with cane thickets.
Painted Bunting			Forest Type - Scrub Oak/Prairie, Scrub Oak. Succession - Shrub/sapling to pole timber. Special - Dense thicket of shrubs.
	Loggerhead Shrike (Oaks & Prairies Only)		Forest Type - Scrub oak/prairie. Succession - Grass/forb to late. Special - Open country, scattered trees/shrubs, primarily associated with agricultural/farmland.
	Bachman's Sparrow		Forest Type - Pine savanna, longleaf, shortleaf , and loblolly pine, pine/hardwood. Succession - Grass/forb to late. Special - Open canopy pine, containing thick herbaceous cover.

Table 8 (Continued). The priority bird species and their associated habitats for the West Gulf Plain Physiographic Unit (includes the Oaks and Prairies) Ranger Districts from the Kisatchie National Forest, National Forests and Grasslands in Texas, and the Ouchita National Forests.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Yellow-billed Cuckoo			Forest Type - Mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood, oak/hickory. Succession - Mid to late (greater than 20 years old). Special - Thick/tangled vegetation.
Hooded Warbler (Coastal Plain Only)			Forest Type - Mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood, loblolly, pine/hardwood. Succession - Mid to late (greater than 30 years old). Special - Dense deciduous understory, forest interior.
	**Eastern Bewick's Wren (Coastal Plain Only)		Forest Type - Loblolly pine, pine/hardwood, oak/hickory. Succession - grass/forb, shrub/sapling. Special - Snags/live cavities, shrubs/saplings (associated with agricultural settings).
Eastern Wood Pewee (Coastal Plain Only)			Forest Type - Loblolly pine, pine/hardwood, elm/ash/cottonwood, mixed mesic hardwood. Succession - Mid to late (greater than 30 years old).
Yellow-throated Vireo (Coastal Plain Only)			Forest Type - Mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood, oak/hickory. Succession - Mid to Late (greater than 30 years old). Special - Deciduous forest, tall trees, usually near water, open hardwoods, woodland borders.
Prairie Warbler (Coastal Plain Only)			Forest Type - Mixed mesic hardwood, longleaf, shortleaf, and loblolly pine. Succession - Shrub/sapling to late. Special - Open country with poor soil, open pine woodlands with scattered shrub/sapling.

Table 8 (Continued). The priority bird species and their associated habitats for the West Gulf Plain Physiographic Unit (includes the Oaks and Prairies) Ranger Districts from the Kisatchie National Forest, National Forests and Grasslands in Texas, and the Ouchita National Forests.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
**Cerulean Warbler (Coastal Plain Only)			Forest Type - Oak/gum/cypress, elm/ash/cottonwood, oak/hickory. Succession - Late (greater than 60 years old). Special - Mature hardwood with open understory, with trees greater than 20" DBH, forest interior.
Kentucky Warbler (Coastal Plain Only)			Forest Type - Oak/gum/cypress, elm/ash/cottonwood, oak/hickory. Succession - Mid to late (greater than 30 years). Special - Moist, bottom lands, rich deciduous understory, forest interior.
Scissor-tailed Flycatcher (Oaks & Prairies Only)			Forest Type - Scrub oak/prairie. Special - Open habitats, with elevated perches.
**Bell's Vireo (Oaks & Prairies Only)			Forest Types - Elm/ash/cottonwood, pine/hardwood, oak/hickory. Succession - Grass/forb to shrub/sapling (0-10 years). Special - Streamside thickets, shrub/saplings in open areas.
Lark Sparrow (Oaks & Prairies Only)			Forest Type - Scrub oak/prairie. Special - Bare ground, mixture of shrubs and open prairie/grasslands.
White-eyed Vireo (Coastal Plain Only)			Forest Type - Oak/hickory, loblolly and shortleaf pine, pine/hardwood, mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood. Succession - Shrub/sapling. Special - Dense, moist thickets.

Table 8 (Continued). The priority bird species and their associated habitats for the West Gulf Plain Physiographic Unit (includes the Oaks and Prairies) Ranger Districts from the Kisatchie National Forest, National Forests and Grasslands in Texas, and the Ouchita National Forests.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
	Red-headed Woodpecker (Coastal Plain Only)		Forest Type - Pine savanna, longleaf, shortleaf, and loblolly pine, oak/gum/cypress, oak/hickory. Succession - Grass/forb to late. Special - Open canopy, with snags (greater than 14" DBH), early succession with scattered snags.
	Field Sparrow (Coastal Plain Only)		Forest Type - Loblolly, shortleaf, and longleaf, pine/hardwood, oak/hickory. Succession - Grass/forb, shrub/sapling (0-10 years). Special - Scattered saplings, shrubs with tall herbaceous cover.
Chuck-will's-widow			Forest Type - Mixed mesic hardwoods, loblolly pine, pine/hardwood. Succession - Mid to late (greater than 20 years old). Special - Moderate understory, near open country.
		Northern Bobwhite	Forest Type - Pine savanna, longleaf, shortleaf, and loblolly pine, pine hardwood, oak/hickory, scrub oak/prairie. Succession - Grass/forb to late. Special - Grass/forb habitats for nesting, winter roosting cover, food, brood rearing located in early succession (0-5 years) or open, fire dominated pine habitats. (See FSH 405)

Table 8 (Continued). The priority bird species and their associated habitats for the West Gulf Plain Physiographic Unit (includes the Oaks and Prairies) Ranger Districts from the Kisatchie National Forest, National Forests and Grasslands in Texas, and the Ouchita National Forests.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
		Wild Turkey (Coastal Plain Only)	Forest Type - Mixed mesic hardwood, longleaf, slash, and loblolly pine, oak/gum/cypress, live oak/maritime, pine/hardwood, oak/hickory. Succession - Mid -late successional habitats with scattered early successional habitats. Special - Hard mast sources, large conifer roost trees, scattered grass/forb brooding areas, well distributed water sources, mostly open understories, woodland margins for nesting, ~1000 acre home range. (See FSH 401).
		Pileated Woodpecker (Coastal Plain Only)	Forest Type - Mixed mesic hardwood, oak/gum/cypress, elm/ash/cottonwood, pine/hardwood, oak/hickory. Succession - Mid to late (greater than 30 years old). Special - Large snags/live cavity trees (greater than 20" DBH) in mostly deciduous forests, requires some late succession
	Henslow's Sparrow (W)		Forest Type - Pine savanna, southern scrub oak, sand pine/scrub oak, longleaf, slash, and loblolly pine, sandhills longleaf, pine hardwood, oak/hickory. Succession - Grass/forb to late. Special - Grass/forb habitats for winter roosting cover and food located in early succession (0-5 years) or open, fire dominated pine habitats.

Table 8 (Continued). The priority bird species and their associated habitats for the West Gulf Plain Physiographic Unit (includes the Oaks and Prairies) Ranger Districts from the Kisatchie National Forest, National Forests and Grasslands in Texas, and the Ouchita National Forests.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
	LeConte's Sparrow (W)		Forest Type - Pine savanna, southern scrub oak, sand pine/scrub oak, longleaf, slash, and loblolly pine, sandhills longleaf, pine hardwood, oak/hickory. Succession - Grass/forb to late. Special - Grass/forb habitats (vegetation > 2 feet high) for winter roosting cover and food, or open, fire dominated pine habitats.
	Sprague's Pipit (W)		Forest Type - Pine savanna, southern scrub oak, sand pine/scrub oak, longleaf, slash, and loblolly pine, sandhills longleaf, pine hardwood, oak/hickory. Succession - Grass/forb. Special - Grass/forb habitats (short grass) for winter roosting cover and food located in early succession (0-5 years).
	Smith's Longspur (W)		Forest Type - Scrub Oak/Prairies. Succession - Grass/forb prairies.
	Chestnut-collared Longspur (W)		Forest Type - Mesic Forest Types. Succession - Early succession (0-5)
	Harris's Sparrow (W)		Forest Type - Dense, vine covered riparian thickets in open prairie country.

(W) Wintering Species
****Peripheral species to physiographic unit.**

Table 9. The priority breeding bird species and their associated habitats for the Cumberland Plateau Physiographic Unit that includes Ranger Districts from the Daniel Boone National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Cerulean Warbler			Forest Type - Oak/hickory, cove hardwood. Succession - Late (greater than 60 years old). Special - Mature hardwoods with open understory, with trees greater than 20" DBH, forest interior.
		**Red-cockaded Woodpecker (Southern Portion of physiographic unit)	Forest Type - Shortleaf pine, Virginia pine. Succession - Mid to late. Special - See Regional RCW Guidelines (In Draft).
*Golden-winged Warbler			Forest Type - Oak/hickory, cove hardwood, maple/beech/birch. Succession - Shrub/sapling (0-10 years). Special - Deciduous saplings.
		Eastern Bewick's Wren	Forest Type - Pine/hardwood, oak/hickory, maple/beech/birch. Succession - Grass/forb, shrub/sapling (0-10 years). Special - Dead/living cavities, rock outcrops, slash/windrows.
*Chestnut-sided Warbler			Forest Type - Pine/hardwood, oak/hickory, maple/beech/birch, cove hardwood, spruce/fir. Succession - Shrub/sapling (0-10 years). Special - Open canopy conditions, deciduous shrub/sapling.
Prairie Warbler			Forest Type - Shortleaf pine, pine/hardwood, oak/hickory. Succession - Shrub/sapling. Special - Open country, poor soil.
Swainson's Warbler			Forest Type - Cove hardwood, white pine/hemlock. Succession - Mid to late (greater than 30 years old). Special - Dense understory, usually rhododendron or mountain laurel, forest interior.

Table 9 (Continued). The priority breeding bird species and their associated habitats for the Cumberland Plateau Physiographic Unit that includes Ranger Districts from the Daniel Boone National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Worm-eating Warbler			Forest Type - Oak/hickory, cove hardwood,. Succession - Mid to late (greater than 30 years old). Special - Closed canopy, dense deciduous/broadleaf understory on steep slopes, forest interior.
	Field Sparrow		Forest Type - Shortleaf pine, Virginia pine/pitch pine, pine/hardwood, oak/hickory. Succession - Grass/forb, shrub/sapling (0-10 years). Special - Scattered saplings, shrubs, with tall herbaceous cover.
Louisiana Waterthrush			Forest Type - Oak/hickory, cove hardwood. Succession - Late (greater than 60 years old). Special - Deciduous forest with rocky flowing stream, forest interior.
Eastern Wood-Pewee			Forest Type - Loblolly and shortleaf, white pine/hemlock, cove hardwood, maple/beech/birch/, spruce/fir. Succession - Mid to late (greater than 30 years old).
Acadian Flycatcher			Forest Type - Oak/hickory, white pine/hemlock, cove hardwood. Succession - Late (greater than 60 years old). Special - Closed canopy deciduous forest near stream, moderate understory, snags, forest interior.
Wood Thrush			Forest Type - Pine/hardwood, oak/hickory, white pine/hemlock, cove hardwood, shortleaf pine. Succession - Mid to late (greater than 30 years old). Special - Well developed deciduous understory of shrub/sapling, closed canopy, forest interior.

Table 9 (Continued). The priority breeding bird species and their associated habitats for the Cumberland Plateau Physiographic Unit that includes Ranger Districts from the Daniel Boone National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Yellow-throated Vireo			Forest Type - Oak/Hickory. Succession - Late (greater than 60 years old). Special - Deciduous, open understory, with trees greater than 20" DBH.
Hooded Warbler			Forest Type - Loblolly and shortleaf pine, pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid to late (greater than 30 years old). Special - Dense deciduous understory, forest interior.
	**Bachman's Sparrow		Forest Type - Shortleaf pine, pine/hardwood. Succession - Grass/forb, shrub/sapling (0-10 years).
Ovenbird			Forest Type - Pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid to late (greater than 30 years). Special - Forest interior.
*Canada Warbler			Forest Type - White Pine/hemlock, cove hardwood, maple/beech/birch, spruce/fir. Succession - Mid to late (greater than 30 years old). Special - Dense understory, prefers rhododendron or mountain laurel.

Table 9 (Continued). The priority breeding bird species and their associated habitats for the Cumberland Plateau Physiographic Unit that includes Ranger Districts from the Daniel Boone National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Summer Tanager			Forest Type - Shortleaf pine, pine/hardwood, oak/hickory. Succession - Mid to late (greater than 30 years). Special - Prefers dry sites.
		Northern Bobwhite	Forest Type -Shortleaf, Virginia pine and pitch pine, pine/hardwood, oak/hickory. Succession - Interspersion of early successional habitats in mid to late successional habitats. Special - Grass/forb habitats for nesting, winter roosting cover, food, brood rearing located in early succession (0-5 years) or open, pine habitats. (See FSH 405)
		Pileated Woodpecker	Forest Type - Pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid and late succession (greater than 30 years). Special - Large snags/live cavity (greater than 20" DBH) for nesting/roosting, distribution of habitats capable of producing large cavities/snags and foraging opportunities, forest interior.
		Wild Turkey	Forest Type - Shortleaf, pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid -late successional habitats with scattered early successional habitats. Special - Hard mast sources, large conifer roost trees, scattered grass/forb brooding areas, well distributed water sources, mostly open understories, woodland margins for nesting, ~1000 acre home range. (See FSH 401).

Table 9 (Continued). The priority breeding bird species and their associated habitats for the Cumberland Plateau Physiographic Unit that includes Ranger Districts from the Daniel Boone National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
	Northern Flicker		Forest Type - Shortleaf, Virginia and pitch pine, pine/hardwood, oak/hickory, white pine/hemlock, cove hardwood. Succession -Grass/forb and shrub/sapling habitats (0-10 years) and mid to late successional (greater than 30 years). Special - Live cavities and snags greater than 14" DBH, open habitats or open understories.

*** Isolated Population**

**** Peripheral species to physiographic unit**

Table 10. The priority breeding birds and their associated habitats for the Ozark-Ouachita Highlands that includes the Ranger Districts from the Ozark National Forest and the Ouachita National Forests.

NTMB Species	Temporate Migratory Species	Resident Species	Habitat Parameters
	Eastern Bewick's Wren		Forest Type - Pine/hardwood, oak/hickory, maple/beech/birch. Succession - Grass/forb, shrub/sapling (0-10 years). Special - Dead/living cavities, rock outcrops, slash/windrows.
		**Red-cockaded Woodpecker	Forest Type - Loblolly and shortleaf pine. Succession - Mid to late. Special - See Regional RCW Guidelines (In Draft).
Cerulean Warbler			Forest Type - Oak/hickory, cove hardwood. Succession - Late (greater than 60 years old). Special - Mature hardwoods with open understory, with trees greater than 20" DBH, forest interior.
Swainson's Warbler			Forest Type - Cove hardwood, white pine/hemlock. Succession - Mid to late (greater than 30 years old). Special - Dense understory, usually switch cane or mountain laurel, forest interior.
	Field Sparrow		Forest Type - Loblolly and shortleaf pine, pine/hardwood, oak/hickory. Succession - Shrub/sapling. Special - Open country, poor soil.
Great Crested Flycatcher			Forest Type - Mixed mesic hardwood, shortleaf and loblolly pine, oak/gum/cypress, elm/ash/cottonwood, pine/hardwood. Succession - Mid to late (greater than 30 years old). Special - Open woods, snags and live cavities greater than 10" DBH for nesting.

Table 10 (Continued). The priority breeding birds and their associated habitats for the Ozark-Ouachita Highlands that includes the Ranger Districts from the Ozark National Forest and the Ouachita National Forests.

NTMB Species	Temporate Migratory Species	Resident Species	Habitat Parameters
Wood Thrush			Forest Type - Pine/hardwood, oak/hickory, cove hardwood, shortleaf & loblolly pine. Succession - Mid to late (greater than 30 years old). Special - Well developed deciduous understory of shrub/sapling, closed canopy, forest interior.
Bell's Vireo			Forest Types - Elm/ash/cottonwood, pine/hardwood, oak/hickory. Succession - Grass/forb to shrub/sapling (0-10 years). Special - Streamside thickets, shrub/saplings in open areas, former prairies.
Prairie Warbler			Forest Type - Loblolly and shortleaf pine, pine/hardwood, oak/hickory. Succession - Shrub/sapling. Special - Open country, poor soil.
Worm-eating Warbler			Forest Type - Oak/hickory, cove hardwood,. Succession - Mid to late (greater than 30 years old). Special - Closed canopy, dense deciduous/broadleaf understory on steep slopes, forest interior.
Eastern Wood Pewee			Forest Type - Loblolly and shortleaf, cove hardwood, maple/beech/birch. Succession - Mid to late (greater than 30 years old).
Prothonotary Warbler			Forest Type - Oak/gum/cypress, elm/ash/cottonwood. Succession - Mid to late (greater than 30 years old). Special - Swamps/bottom lands with standing water and scattered snags/stumps
	**Bachman's Sparrow		Forest Type - Loblolly and shortleaf pine, pine/hardwood. Succession - Grass/forb, shrub/sapling (0-10 years).

Table 10 (Continued). The priority breeding birds and their associated habitats for the Ozark-Ouachita Highlands that includes the Ranger Districts from the Ozark National Forest and the Ouachita National Forests.

NTMB Species	Temporate Migratory Species	Resident Species	Habitat Parameters
Ovenbird			Forest Type - Pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid to late (greater than 30 years). Special - Forest interior.
Hooded Warbler			Forest Type - Loblolly and shortleaf pine, pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid to late (greater than 30 years old). Special - Dense deciduous understory, forest interior.
		Pileated Woodpecker	Forest Type - Pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid and late succession (greater than 30 years). Special - Large snags/live cavity (greater than 20" DBH) for nesting/roosting, distribution of habitats capable of producing large cavities/snags and foraging opportunities, forest interior.
	Red-headed Woodpecker		Forest Type - Shortleaf, and loblolly pine, oak/gum/cypress, oak/hickory. Succession - Grass/forb to late. Special - Open canopy, with snags (greater than 14" DBH), early succession with scattered snags.

Table 10 (Continued). The priority breeding birds and their associated habitats for the Ozark-Ouachita Highlands that includes the Ranger Districts from the Ozark National Forest and the Ouachita National Forests.

NTMB Species	Temporate Migratory Species	Resident Species	Habitat Parameters
		Northern Bobwhite	Forest Type -Loblolly and shortleaf pine, pine/hardwood, oak/hickory. Succession - Interspersion of early successional habitats in mid to late successional habitats. Special - Grass/forb habitats for nesting, winter roosting cover, food, brood rearing located in early succession (0-5 years) or open, pine habitats. (See FSH 405)
	American Woodcock		Forest Type - Oak/gum/cypress, elm/ash/cottonwood, pine/hardwood, oak/hickory. Succession - Mid to late. Special - Woodland thickets, bottom land forests, moderate shrub layer, abundant dead litter, standing water.
		Wild Turkey	Forest Type - Loblolly and shortleaf, pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid -late successional habitats with scattered early successional habitats. Special - Hard mast sources, large conifer roost trees, scattered grass/forb brooding areas, well distributed water sources, mostly open understories, woodland margins for nesting, ~1000 acre home range. (See FSH 401).
	LeConte's Sparrow (W)		Forest Type - Loblolly and shortleaf pine, pine hardwood, oak/hickory. Succession - Grass/forb to late. Special - Grass/forb habitats (vegetation > 2 feet high) for winter roosting cover and food, or open, fire dominated pine habitats.

****Peripheral species to physiographic unit.**

Table 11. The priority bird species and associated habitats for the Southern Cumberland Plateau/Ridge and Valley Physiographic Unit that includes Ranger Districts from the National Forests in Alabama and the Chattahoochee - Oconee National Forests.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
	Appalachian Bewick's Wren		Forest Type - Pine/hardwood, oak/hickory, maple/beech/birch. Succession - Grass/forb, shrub/sapling (0-10 years). Special - Dead/living cavities, rock outcrops, slash/windrows.
		Red-cockaded Woodpecker	Forest Type - Longleaf, Loblolly and shortleaf pine, Virginia pine. Succession - Mid to late. Special - See Regional RCW Guidelines (In Draft).
Yellow-throated Vireo			Forest Type - Oak/Hickory. Succession - Late (greater than 60 years old). Special - Deciduous, open understory, with trees greater than 20" DBH.
	**Bachman's Sparrow		Forest Type - Longleaf, Loblolly and shortleaf pine, pine/hardwood. Succession - Grass/forb, shrub/sapling (0-10 years), mid to late succession. Special - Open canopy, with herbaceous understory.
	Field Sparrow		Forest Type - Loblolly and shortleaf pine, pine/hardwood, oak/hickory. Succession - Shrub/sapling. Special - Open country, poor soil.
Blue-winged Warbler			Forest Type - Oak/hickory. Succession - Shrub/sapling (0-10 years). Special - Overgrown field or thickets.

Table 11 (Continued). The priority bird species and associated habitats for the Southern Cumberland Plateau/Ridge and Valley Physiographic Unit that includes Ranger Districts from the National Forests in Alabama and the Chattahoochee - Oconee National Forests.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
**Swainson's Warbler			Forest Type - Cove hardwood, white pine/hemlock. Succession - Mid to late (greater than 30 years old). Special - Dense understory, usually rhododendron or mountain laurel, forest interior.
		Brown-headed Nuthatch	Forest Type - Longleaf pine/scrub oak, longleaf, shortleaf, and loblolly pine. Succession - Mid to late. (greater than 30 years old). Special - Open pine woodlands, snags and live cavity trees.
Eastern Wood Pewee			Forest Type - Loblolly and shortleaf, white pine/hemlock, cove hardwood, maple/beech/birch/, spruce/fir. Succession - Mid to late (greater than 30 years old).
Wood Thrush			Forest Type - Pine/hardwood, oak/hickory, white pine/hemlock, cove hardwood, shortleaf & loblolly pine. Succession - Mid to late (greater than 30 years old). Special - Well developed deciduous understory of shrub/sapling, closed canopy, forest interior.
Prairie Warbler			Forest Type - Loblolly and shortleaf pine, pine/hardwood, oak/hickory. Succession - Shrub/sapling. Special - Open country, poor soil.
**Cerulean Warbler			Forest Type - Oak/hickory, cove hardwood. Succession - Late (greater than 60 years old). Special - Mature hardwoods with open understory, with trees greater than 20" DBH, forest interior.

Table 11 (Continued). The priority bird species and associated habitats for the Southern Cumberland Plateau/Ridge and Valley Physiographic Unit that includes Ranger Districts from the National Forests in Alabama and the Chattahoochee - Oconee National Forests.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Prothonotory Warbler			Forest Type - Oak/gum/cypress, elm/ash/cottonwood. Succession - Mid to late (greater than 30 years old). Special - Swamps/bottom lands with standing water and scattered snags/stumps.
Louisiana Waterthrush			Forest Type - Oak/hickory, cove hardwood. Succession - Late (greater than 60 years old). Special - Deciduous forest with rocky flowing stream, forest interior.
Hooded Warbler			Forest Type - Loblolly and shortleaf pine, pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid to late (greater than 30 years old). Special - Dense deciduous understory, forest interior.
	Loggerhead Shrike		Forest Type - Upland pine. Succession - Grass/forb to late. Special - Open country, scattered trees/shrubs.
Acadian Flycatcher			Forest Type - Oak/hickory, white pine/hemlock, cove hardwood. Succession - Late (greater than 60 years old). Special - Closed canopy deciduous forest near stream, moderate understory, snags, forest interior.

Table 11 (Continued). The priority bird species and associated habitats for the Southern Cumberland Plateau/Ridge and Valley Physiographic Unit that includes Ranger Districts from the National Forests in Alabama and the Chattahoochee - Oconee National Forests.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Summer Tanager			Forest Type - Shortleaf pine, pine/hardwood, oak/hickory. Succession - Mid to late (greater than 30 years). Special - Prefers dry sites.
Whip-Poor-Will			Forest Type - Loblolly and shortleaf, Virginia pine and pitch pine, pine/hardwood, oak/kickory Succession - Mid to late. Special - Leaf litter, Upland woodlands, not far from open country.
Chuck-will's-widow			Forest Type - Mixed mesic hardwoods, loblolly pine, pine/hardwood. Succession - Mid to late (greater than 20 years old). Special - Moderate understory, near open country.
Kentucky Warbler			Forest Type - Oak/gum/cypress, elm/ash/cottonwood, oak/hickory. Succession - Mid to late (greater than 30 years). Special - Moist, bottom lands, rich deciduous understory, forest interior.

Table 11 (Continued). The priority bird species and associated habitats for the Southern Cumberland Plateau/Ridge and Valley Physiographic Unit that includes Ranger Districts from the National Forests in Alabama and the Chattahoochee - Oconee National Forests.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
		Northern Bobwhite	Forest Type -Shortleaf, Virginia pine and pitch pine, pine/hardwood, oak/hickory. Succession - Interspersion of early successional habitats in mid to late successional habitats. Special - Grass/forb habitats for nesting, winter roosting cover, food, brood rearing located in early succession (0-5 years) or open, pine habitats. (See FSH 405)
	Red-headed Woodpecker		Forest Type - Pine savanna, longleaf/scrub oak, sandhills longleaf, pond pine pocosin, longleaf, slash, and loblolly, oak/gum/cypress, oak/hickory. Succession - Grass/forb to late. Special - Open canopy, with snags (greater than 14" DBH), early succession with scattered snags.
		Pileated Woodpecker	Forest Type - Pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch. Succession - Mid and late succession (greater than 30 years). Special - Large snags/live cavity (greater than 20" DBH) for nesting/roosting, distribution of habitats capable of producing large cavities/snags and foraging opportunities, forest interior.

		Wild Turkey	**Forest Type - Shortleaf, pine/hardwood, oak/hickory, cove hardwood, maple/beech/birch.** **Succession - Mid -late successional habitats with scattered early successional habitats.** **Special - Hard mast sources, large conifer roost trees, scattered grass/forb brooding areas, well distributed water sources, mostly open understories, woodland margins for nesting,** **~1000 acre home range.** **(See FSH 401).**

Table 12. The breeding and wintering priority bird species and associated habitats for the West Indies Physiographic Unit that includes the Caribbean National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
		Limpkin	Low mesic 2nd growth
		Plain Pigeon	Low mesic 2nd growth
		Puerto Rican Parrot	Wet limestone forest, montane 2nd growth, low mesic 2nd growth
		Puerto Rican Nightjar	Dry scrub, dry limestone forest
		Yellow-shouldered Blackbird	Mangrove, dry scrub, low mesic 2nd growth
		Sharp-shinned Hawk	Montane 2nd growth
		Broad-winged Hawk	Wet limestone forest, montane 2nd growth
White-crowned Pigeon			Mangrove, low mesic 2nd growth
		Elfin Woods Warbler	Montane 2nd growth

Table 12 (Continued). The breeding and wintering priority bird species and associated habitats for the West Indies Physiographic Unit that includes the Caribbean National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
		Grasshopper Sparrow	Shade pasture, open pasture
		Puerto Rican Lizard-Cuckoo	Dry scrub, dry limestone forest, wet limestone forest, montane broadleaf forest, montane 2nd growth, mesic moist forest, low mesic 2nd growth, shade coffee
Black Swift			Montane 2nd growth
		Lesser Antillean Pewee	Mangrove, dry scrub, dry limestone forest, wet limestone forest, montane broadleaf forest, montane 2nd growth, low mesic 2nd growth
		Puerto Rican Vireo	Dry limestone forest, wet limestone forest
		Bridled Quail-Dove	Wet limestone forest, mesic moist forest, low mesic 2nd growth
Cave Swallow			Bridges, buildings, open areas
Black-throated Blue Warble			Wet limestone forest, montane broadleaf forest, montane 2nd growth, mesic moist forest, low mesic 2nd growth
		Puerto Rican Screech Owl	Dry scrub, dry limestone forest, wet limestone forest, montane broadleaf forest, montane 2nd growth, mesic moist forest, low mesic 2nd growth, shade coffee
		Short-eared Owl	Open pasture
		Antillean Mango	Mangrove, dry scrub, dry limestone forest, mesic moist forest, low mesic 2nd growth

Table 12 (Continued). The breeding and wintering priority bird species and associated habitats for the West Indies Physiographic Unit that includes the Caribbean National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
		Puerto Rican Flycatcher	Mangrove, dry scrub, dry limestone forest, wet limestone forest, montane broadleaf forest, montane 2nd growth, mesic moist forest, low mesic 2nd growth, shade coffee
		Puerto Rican Tanager	Wet limestone forest, montane broadleaf forest, montane 2nd growth, low mesic 2nd growth
Golden-winged warbler (W)			Montane broadleaf forest
Black-whiskered vireo			Mangrove, dry limestone forest, wet limestone forest, montane broadleaf forest, montane 2nd growth, mesic moist forest, low mesic 2nd growth, shade coffee
Prairie Warbler (W)			Mangrove, dry scrub, dry limestone forest, low mesic 2nd growth, moist mesic forest, shade pasture
		Scaly-napped Pigeon	Montane broadleaf forest
		Key West Quail-Dove	Dry scrub, dry limestone forest, wet limestone forest
		Puerto Rican Emerald	Dry limestone, montane 2nd growth, montane broadleaf forest, shade coffee

Table 12 (Continued). The breeding and wintering priority bird species and associated habitats for the West Indies Physiographic Unit that includes the Caribbean National Forest.

NTMB Species	Temperate Migratory Species	Resident Species	Habitat Parameters
Bicknell's Gray-cheeked Thrush		Golden Warbler	All forests especially where palm is present
		Black-cowled oriole	All forests especially where palm is present
			Montane 2nd growth
		Green Mango	Montane 2nd growth, montane broadleaf forest, shade coffee
		Antillean Crested Hummingbird	Mesic moist forest
		Puerto Rican Tody	Dry limestone forest, wet limestone forest, montane 2nd growth, montane broadleaf forest, shade coffee
		Puerto Rican Woodpecker	Mangrove, dry limestone forest, wet limestone forest, montane 2nd growth, montane broadleaf forest, mesic moist forest, shade coffee
		Adelaide's Warbler	Dry scrub, dry limestone forest, wet limestone forest
		Puerto Rican Bullfinch	Dry scrub, dry limestone forest, wet limestone forest, montane 2nd growth, montane broadleaf forest

Table 13. The relationship of the goals, monitoring questions, species, and monitoring techniques for the Southern National Forest's Forest Landbird Conservation Strategy.

Monitoring Questions	Affected Species/ Species Groups/ Habitats	Monitoring Techniques	Units of Measure	Frequency	Needed Precision	Expected Precision
Regional Questions 1, 2, 5, 6, & 9 (pages 17, 18) **Physiographic Unit** Questions 1, 2, 5, 6, and 10 (pages 19, 20)	Most Priority Species	Breeding Season Point Counts	Birds Observed; Percent change in birds observed.	Annual	Medium to High	High
	RCW	Cluster Surveys	Clusters	See Draft Regional Guidelines	High	High
		Group Status Checks	Groups	See Draft Regional Guidelines	High	High
	Bald Eagle	Nest Checks	Br. Pr.	Annual or Biennial	High	High
	Florida Burrowing Owl					
	Florida Short-tailed Hawk					
	American Swallow-tailed Kite	Nest Counts	Active Nests	Annual or Biennial	High	High
	Southeastern American Kestrel	Breeding Season Point Counts	Percent change in birds observed	Annual	High	Medium
	American Woodcock	Breeding Season Point Counts	Percent change in birds observed	Annual	Medium	Medium

Table 13 (Continued). The relationship of the goals, monitoring questions, species, and monitoring techniques for the Southern National Forest's Forest Landbird Conservation Strategy.

Monitoring Questions	Affected Species/ Species Groups/ Habitats	Monitoring Techniques	Units of Measure	Frequency	Needed Precision	Expected Precision
(Continued) Regional Questions 1, 2, 5, & 6 (pages 17, 18) **Physiographic Unit** Questions 1, 2, 5, & 6 (pages 19, 20)	Ruffed Grouse	Early Spring Supplemental Point Counts (Subset)	Percent change in birds observed	Annual	Medium	Medium
		State Harvest Data	# of Birds	Annual	Medium	Low to Medium
	Wild Turkey	Early Spring Supplemental Point Counts (Subset)	Percent change in birds observed	Annual or Biennial	Medium	Medium
		Brood Surveys	# of Broods Birds per Brood	Annual or Biennial	Low to Medium	Low
		State Harvest Data	# of Birds	Annual	Medium	Low to Medium
	Northern Bobwhite	Breeding Season Point Counts	Percent change in birds observed	Annual	Medium	Medium
		State Harvest Data	# of Birds	Annual	Medium	Low to Medium

Table 13 (Continued). The relationship of the goals, monitoring questions, species, and monitoring techniques for the Southern National Forest's Forest Landbird Conservation Strategy.

Monitoring Questions	Affected Species/ Species Groups/ Habitats	Monitoring Techniques	Units of Measure	Frequency	Needed Precision	Expected Precision
Regional Questions 3, 4, 5, 6, & 7 (Pages 17, 18) **Physiographic Unit** Questions 3, 4, 5, 6, & 7 (Pages 19, 20)	Successional Stages: 0-5 years 6-10 years 10-20 years 21-30 years 31-60 years 61-100 years 100+ years, for each of the habitat groups identified in Tables 3-10.	CISC Data, in combination with community classification.	Acres	Every 5 years	Medium	Medium
Regional Question 8 (Page 18) **Physiographic Unit** Questions 8, 9 (Pages 20, 21)	All priority species (except Florida Burrowing Owl, Florida Short-tailed Hawk, SE American Kestrel).	Habitat Capability Models	# of Birds (expressed as breeding pairs, # of birds, # of groups.	Every 5 Years	Medium	Low to Medium
		Spot Mapping	Breeding Pairs stratified by habitat group.	Each Plot every 3 years	Medium	Medium

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Appendix A. The Southern Region's breeding species list (concern scores of 19 to 23) for neotropical migratory birds, temporate migratory birds, and resident birds, based on the Partners in Flight prioritization scheme for the Southeast as of May, 1996 (Hunter, et al, 1992; Hunter, unpublished) that are in need of at least monitoring.

Neotropical Migrants	Temperate Migrants	Residents
Gray Catbird Northern Parula Black-throated Green Warbler Yellow-throated Warbler Northern Baltimore Oriole Black-throated Blue Warbler	Sedge Wren Sharp-tailed Sparrow	
Scissor-tailed Flycatcher Black-and-white Warbler Ovenbird Summer Tanager Scarlet Tanager Dickcissel Lark Sparrow Chestnut-sided Warbler White-eyed Vireo Canada Warbler	Red-shouldered Hawk	Carolina Chickadee
Alder Flycatcher Eastern Kingbird American Redstart Mourning Warbler Yellow-breasted Chat Grasshopper Sparrow	Bald Eagle	Common Ground Dove Tufted Titmouse Limpkin
Broad-winged Hawk Chimney Swift Olive-sided Flycatcher Rose-breasted Grosbeak Indigo Bunting	Northern Harrier Winter Wren Marsh Wren Brown Thrasher	Eastern Screech Owl
Peregrine Falcon Blue-gray Gnatcatcher Willow Flycatcher Least Flycatcher Veery Swainson's Thrush	Rufous-sided Towhee	

Appendix B. Incorporating the management of the priority bird species into Subregional Assessments and Forest Land and Resource Management Plan (FLRMP) Revisions.

Introduction

The specific objectives and management direction for forest landbirds at the Regional scale, Physiographic Unit scale, and Forest scale, will be determined through the Decisions that are made in the FLRMP revisions. These forest-level decisions should relate to: (1) the priority species identified by the Partners in Flight Southeast Working Group as needing conservation attention at the physiographic area (physiographic unit) scale, (2) the capability of a Forest to sustain the wide mix of habitats necessary to sustain the priority species overtime, and (3) determination of the desired levels of habitats for the priority species based on coordination with states, PIF physiographic area goals (based on the voluntary participation of private landowners, industrial forest managers, other states/federal agencies), T&E recovery efforts, needs of other WF&B resources, and providing other natural resources and uses desired by the public. This appendix illustrates this process and the desired results of incorporating the management of forest landbirds into subregional assessments and the FLRMP. Additional guidance for this process can be found in Gaines (1993) and SAMAB (1996).

This illustration will use the process and results found in the Southern Appalachian Assessment as an example and how a mountain forest may incorporate landbirds into it's forest plan.

The Southern Appalachian Assessment (SAA): An Example for Intergrating Priority Landbirds into Subregional Ecosystem Assessments

Identification of Species and Habitats for Emphasis

The SAA used a coarse and fine filter approach to assess terrestrial plant and animal resources for the region. Through "coarse filtration" 16 broad landcover classes were identified. Nine of these were forest classes that were futher defined by 4 successional classes. These successional classes included early successional grass/shrub, sapling/pole, mid-successional, and late successional. Ages for these successional stages varied by forest type. These broad cover classes were used to determine current and past landscape patterns for these general habitats. The information was also utilized to model habitat suitablility for specific groups of species. In addition, 31 rare communities were identified during through this coarse filter.

As part of the fine filter approach, a total of 472 individual plant and animal species were identified for emphasis in the SAA. To be included, a species had to meet one of six criteria:

(1) Federally-proposed threatened and endangered species (T&E)

(2) Other species with viability concerns (VC), including federal candidate species in categories 1 or 2 and species with a Nature Conservancy global rank of 1, 2 or 3
(3) Game species
(4) Species with high management or public interest (PIF high priority landbirds with prioritization scores of 24 and greater)
(5) Species with demanding habitat parameters
(6) Keystone speciesFederally listed as threatened or endangered

Using this process a total of 47 birds were selected (Table B-1). Species and their relationships to habitats were documented using a species/habitat matrix. Information from the matrix was used to develop landscape habitat suitability models and to organanize the 47 species into 11 groupings based on habitat associations. These groups were then the focus of the assessment. This same process is applicable to forest and project-level planning.

Table B-1. The terrestrial birds selected for emphasis in the Southern Appalachian Assessment.

Scientific Name	Common Name	Selection Criteria1	Habitat Association2
Dendroica pensylvanica	Chestnut-sided Warbler	5	5
Thryomanes bewickii altus	Appalachian Bewick's Wren	2	5
Falco peregrinus anatum	American Peregrine Falcon	1	7
Aimophila aestivalis	Bachman's Sparrow	2	8
Ammodramus henslowii	Henslow's Sparrow	2	8
Colinus virginianus	Northern Bobwhite	4	8
Dendroica discolor	Prairie Warbler	5	8
Lanius ludovicianus	Loggerhead Shrike	2	8
Spizella pusilla	Field Sparrow	5	8
Vermivora chrysoptera	Golden-winged Warbler	5	8
Vermivora pinus	Blue-winged Warbler	5	8
Contopus virens	Eastern Wood-Pewee	5	10
Picoides pubescens	Downy woodpecker	7	10
Empidonax virescens	Acadian Flycatcher	5	11
Haliaeetus leucocephalus	Bald Eagle	1	11
Scolopax minor	American Woodcock	4	11
Seiurus motacilla	Louisiana Waterthrush	5	11
Bonasa umbellus	Ruffed Grouse	4	12
Colaptes auratus	Northern Flicker	6	12
Dumetella carolinensis	Gray Catbird	5	12
Melanerpes erythrocephalus	Red-headed Woodpecker	6	12
Meleagris gallopavo	Eastern Wild Turkey	4	12

Table B-1 (continued). The terrestrial birds selected for emphasis in the Southern Appalachian Assessment.

Scientific Name	Common Name	Selection Criteria1	Habitat Association2
Coccyzus erythropthalmus	Black-billed Cuckoo	5	13
Dendroica cerulea	Cerulean Warbler	2	13
Dendroica virens	Black-throated Green Warbler	5	13
Dryocopus pileatus	Pileated Woodpecker	6	13
Helmitheros vermivorus	Worm-eating Warbler	5	13
Hylocichla mustelina	Wood Thrush	5	13
Limnothlypis swainsonii	Swainson's Warbler	5	13
Melanerpes carolinus	Red-bellied woodpecker	7	13
Oporornis formosus	Kentucky Warbler	5	13
Parula americana	Northern Parula	5	13
Picoides villosus	Hairy Woodpecker	7	13
Piranga olivacea	Scarlet Tanager	5	13
Piranga rubra	Summer Tanager	5	13
Seiurus aurocapillus	Ovenbird	5	13
Vireo flavifrons	Yellow-throated Vireo	5	13
Wilsonia citrina	Hooded Warbler	5	13
Dendroica caerulescens	Black-throated Blue Warbler	5	14
Dendroica fusca	Blackburnian Warbler	5	14
Loxia curvirostra	Red Crossbill	5	14
Wilsonia canadensis	Canada Warbler	5	14
Accipiter gentilis	Northern Goshawk	2	15
Aegolius acadicus	Northern Saw-whet Owl	5	15
Protonotaria citrea	Prothonotory Warbler	5	16
Picoides borealis	Red Cockaded Woodpecker	1	17
Sitta pusilla	Brown-headed Nuthatch	5	17

1 Selection Criteria Codes

- 1 - Federally listed threatened and endangered species
- 2 - Viability concern species (globally ranked 1,2, or 3)
- 4 - Game species
- 5 - High management/public interest species
- 6 - Demanding habitat requirement
- 7 - Keystone or ecological indicator

2 Codes Habitat Associations

- 5 - High elevation balds and early successional habitats
- 7 - Rock outcrop and cliffs
- 8 - Early successional habitats
- 10 - Mid- to late- successional deciduous forest habitats
- 11 - Seeps, springs, and streamside habitats
- 12 - Habitat generalist
- 13 - Area sensitive mid- to late- successional forest species
- 14 - General high elevation forest habitats
- 15 - High elevation spruce-fir/northern hardwood forests
- 16 - Bottomland forests
- 17 - Southern yellow pine forests

Analysis of Landscape Habitat Suitability

In order to identify broadscale habitat patterns within the SAA, spatial analyis was conducted to determine the current habitat conditions for the groups of species. Information used in the analysis included Forest Inventory and Analysis (FIA), LANDSAT Thematic Mapper Imagery, and national forest CISC data. Models were developed using information in the species/habitat matrix to conduct landscape-level analysis for habitat suitability. The results of this analysis was stratified according to ownerships, ecological sections, and for the total SAA. Results are included in this appendixi for only a portion of the habitat suitability analysis in the SAA. Results for area sensitive species associated with mid- to late- successional deciduous forest; species associated with high elevation general forest habitat; and early successsional habitats are included as examples.

Area Sensitive Species

Total SAA Area. There are 16 species included within this habitat association. These species have minimum forest tract size requirements ranging from 2 acres (wood thrush) up to around 4,500 acres (cerulean warbler). Analysis for the total SAA area revealed approximately 15.8 million acres of mid- to late- successional decidous forest habitats in tracts greater than 2 acres in size. Of these acres, 8.2 million acres are in tracts greater than 5,000 acres in size. These 8.2 million acres have the highest potential for supporting all 16 area sensitive bird species. Analysis of forest interior habitat found that around 66 percent of the 15.8 million acres was suitable forest interior habitat.

Ecological Unit. Around 7.1 million acres (4.8 million acres in tracts greater than 5,000 acres) occurs within ecological sections that are greater than 75 percent forested (Blue Ridge Mountains, Northern Cumberland Plateau, and Southern Cumberland Mountains). The remaining acres of suitable habitat in large tracts were in ecological sections with significant amounts agricultural and developed land.

Ownership. Around 39 percent of the suitable acres in large tracts are on national forests. National forests and national parks together contain 46 percent of this habitat in the Southern Appalachians. On national forests it is estimated that around 90 percent of this habitat is suitable forest interior habitat. Federal ownerships are a key component in maintaining habitats for bird species associated with this habitat in the Southern Appalachians.

Species Associated with Early Successional Habitats

Total SAA Area. There are 8 bird species included within this habitat association. They included prairie warbler, Bachman's sparrow, Henslow's sparrow, golden-winged warbler, blue-winged warbler, and bobwhite quail. Analysis for the total SAA area revealed approximately 1.5 million acres of suitable early successional habitat. Of these acres, around 56 percent of this habitat is greater than 20 acres in size. It is expected that over

the next 15 years this habitat will remain near current levels, but habitat quality for some associated species may continue to decline due to isolation of these habitats from landuse changes.

Ecological Unit. Around 65 percent of the early successional habitat is located in the piedmont, southern ridge and valley, and southern Cumberland plateau sections. The Blue Ridge Mountains contain an estimated 116,000 acres (around 8 percent the SAA total).

Ownership. Analysis found that the large majority of these habitats are located on private lands. Currently around 3 percent of national forest land contains early successional habitat. These habitats have declined by 26 percent since the mid 1970s on national forests.

General High Elevation Forest habitat

Total SAA Area. There are 4 bird species included within mid- and late- successional montane spruce-fir, northern hardwoods, white pine-hemlock-hardwood, and mixed mesophytic hardwood forest communities above 3,500 feet in elevation (latitudinally adjusted). Bird species include black-throated blue warbler, blackburnian warbler, red crossbill, and Canada warbler. Analysis for the total SAA area revealed approximately 355,000 acres of suitable habitat. Of these acres, around 42 percent were in forest tracts greater than 5,000 acres. Within these larger tracts it is expected that all 4 priority bird species could be supported. A downward trend is possible for these habitats over the next 15 years due to exotic pests and air pollution.

Ecological Unit. Around 83 percent of the high elevation general forest habitat are located in the Blue Ridge Mountains.

Ownership. National parks contain 74 percent of the large high elevation forest tracts, followed by national forests with 17 percent.

A Forest Land and Resource Management Planning (FLRMP) Example

This example is to show how an average national forest in the Blue Ridge Mountains would take the information from the regional landbird strategy and the findings from the SAA and incorporate those into the FLRMP. While this example is focused on forest birds, this process is appropriate to all terrestrial and aquatic resources.

Identification of Birds and Habitats for Emphasis in the Forest Plan

An obvious first step is to determine the bird species and habitats that will be focused upon in the FLRMP using the coarse-fine filter approach. The SAA accomplished most of this work by identifying the list of bird species, the broad forest cover classes, forest successional classes, rare communities, and developing species habitat relationships. The

forest then determines if species or habitats need to be added or deleted as appropriate to address local or state conditions or issues.

Using this information the forest selects management indicators (or special species if the concept of management indicators is removed) for emphasis in the plan. These management indicators (MI) will consist mostly of groups of species based on habitat associations and some individual species when appropriate. Again the SAA developed groups of species and individual species that can incorporated into the FLRMP. A narrowing of the species groups to more specific habitats associations at the forest-level may be appropriate. This process improves the forest's ability to meet legal obligations related to The National Forest Management Act, Endangered Species Act, National Environmental Protection Act, and in some respects The Migratory Bird Treaty Act.

The Current Conditions of the "Average Blue Ridge National Forest (ABRNF)"

This analysis should include estimates of broad forest cover, occurrences of federally listed species and sensitive species (viability concern species), habitat suitability for groups of species of habitat acres and habitat capability (and/or actual population estimates for some PETS species). Table B-2 provides an example of broad forest current conditions. Table B-3 shows the results of habitat suitability estimates for 3 groups of species for the ABRNF forest.

Table B-2. The existing broad forest habitat conditions of a ABRNF.

Habitat	Stage 1	Stage 2	Stage 3	Stage 4	Total
Oak Forest	13,100	31,900	229,500	253,400	527,900
Mixed Mesophytic Hdwd	3,300	8,000	57,400	63,400	132,100
Northern Hardwoods	0	1,600	13,300	3,100	18,000
Spruce-Fir Forest	0	100	1,600	1,300	3,000
White Pine - Hemlock	3,300	9,200	8,100	1,400	22,000
Southern Pine	3,500	5,500	14,000	27,000	50,000
Mixed Pine -Hdwd	3,500	14,500	108,000	99,000	225,000
White Pine - Hemlock-Hdwd	3,300	9,200	8,100	1,400	22,000
Total Acres (20 year trend)	30,000 (- 4 %)	80,000 (+ 12 %	440,000 (- 6 %)	450,000 (+ 34 %)	1,000,000

Stage 1 - Early Successional **Stage 2** - Sapling - Pole
Stage 3 - Mid Successional **Stage 4** - Late Successional

Table B-3. The Existing Acres of Habitat Suitability for Selected Species Groupings

Habitat Associates	Acres of Suitable Habitat to Support All Species Associates	Additional Habitat Parameters	Estimated 20 year trends
Area Sensitive Species associated with mid to late successional deciduous habitats	710,000 acres in large tracts greater than 5,000 acres. 688,700 of these acres are suitable forest interior habitat	Late successional habitats make up 35 % of the acres (248,500 acres)	4 % increase (FIA data)
General High Elevation Mid- to Late- Successional Forest Habitats	5,600 acres in large tracts greater than 5,000 acres. 5,490 of these acres are suitable forest interior habitat	Late successional habitats make up 20 % of these acres (1,120 acres)	Unknown
Early Successional Habitats	30,000 acres		4 % decrease (FIA data)

Describe the Ecological Capability of the Forest

The forest should determine the capability of their unit to sustain the particular habitats identified for emphasis. The development of these capabilities will be based on the defined ecological units for the Forest. The units used for this will be the Landtype Association (acre units). At this scale the Forests can determine a gross estimate of the level at which the identified habitat groups can be sustained, based on soils, land form, hydrologic descriptions, understood natural processes (such as fire), and descriptions of plant communities associated with the physiographic units. These estimates would be for the broad forest classes. The estimates will be a more generalized description of potential vegetation than those described in the existing conditions and those that will be described in the Forest DFC and objectives. The estimated capabilities will be used to help form the DFC/objectives related to the habitat conditions and spatial arrangement of these habitats on the forest.

Determine the Forest DFC/Objectives

An important part of the forest planning process is the development of a desired future condition and resource objectives for the forest. These should be measurable and quantifiable. There is no time frame for achieving this DFC. It is important to note that the DFC and objectives are formulated based on overall multiple natural resource needs. The rationale for the development of the objectives should be documented. It is preferable for the DFC or objectives to be stated as acres of a particular forest or nonforest habitat. The relationship of these habitat objectives to the high priority landbirds should be clear. It may be appropriate in some cases to state objectives in terms of individual species habitat capability (i.e, game species) or population objectives (i.e, federally listed species). The objectives might be stated as forest-wide or for a management area if more appropriate.

The following provides an example of objectives related to the three groups of habitat associates shown in table B-3.

Examples of DFC Statements Meaningful to the Priority Landbird Species

The acres and distribution of mid to late successional deciduous forest communities will remain near the current levels (table B-3) on the forest. It is expected in the future that around 70 percent of the forest area will be in this condition. Currently the ABRNF contains around nine percent of these habitats potentially suitable habitat for all area sensitive species in the SAA region and this percentage is expected to rise due to decreases in these habitats on private lands. The proportion of these acres in late successional conditions will remain near or slightly above the current levels (table B-3). These late- successional communities are the primary source of large standing snags (greater than 20 inches in dbh) and live cavity trees.

General mid- to late-successional high elevation forests will continue to make up a small percentage (less than one percent) of the forest area. It is desired that the acres of these habitats be maintained or slightly increased from current levels. Careful monitoring of the effects of air pollution and balsam woolly adelgid on these high elevation forests will occur.

Early successional habitats of various sizes are apparent on a small portion of the forest. The acres and distribution of these habitats will remain near current conditions, with a slight increase in the proportion of acres in small patch sizes. These early seral communities range in sizes of 1/4 acre up to 40 acres. It is estimated that at least 2/3 of these acres will be in patch sizes greater than 10 acres. These range of sizes will provide a range of habitats suitable for all the species associated with these habitats. Standing snags larger than 12 inches in dbh are scattered or clumped within these communities.

Examples of Objectives Meaningful to the Priority Landbird Species (other terrestrial plant and animals and other natural resources)

1. Provide mid- to late- deciduous forest conditions above 95% of the current levels during the next 10-15 years. Maintain at least 1/3 of these acres in late successional conditions.

2. Sustain early successional habitats greater than 10 acres in size on at least 20,000 acres.

3. Provide the mix of habitat conditions that include early successional habitats, sapling-pole stages, mast producing hardwood stands, and permanent grassy habitats to provide habitat capability for turkey of 1 bird per 15 acres and for ruffed grouse of 1 bird per 30 acres based on forest habitat capability model calculations.

Determine Management Direction

The Forests will coordinate closely together in the development of management direction. This direction will be in the form of standards and guidelines that are designed to achieve the Forest objectives and move the forest toward the DFC. The purpose of the management direction is to provide the Forest personnel the project-level planning direction for implementing the Forest Plan and that will move the Forest toward the DFC and attaining the objectives. The direction should be consistent across the Forest boundaries. If there are differences, they should be clearly documented and explained. The direction should be considered the minimal levels of actions needed to meet the forest objectives. The management direction may be forest-wide or specific to a management area on a forest. The following are some examples of management direction that will be needed to manage and sustain the identified priority birds and their associated habitats for Forest 1. This list is not intended to be all inclusive of possible management direction.

Examples of Management Direction Meaningful to the Priority Landbird Species

Parameter	**Management Direction**
Early successional grass/forb/ shrub/sapling habitats	Provide at least 25 acres per square mile in patches greater that 10 acres in size (Mgt. Area 1, 3 total 1/2 the forest)
Snags in Early Successional Habitat	Provide 2 snags greater than 12" DBH per acre.
Late Successional Deciduous Forests	Provide at minimum of 150 acres per square mile (Mgt. Area 1, 3 total 1/2 the forest)

Determine the Physiographic Unit/Regional DFC Objectives

The regional and physiographic unit DFC and objectives will be determined based on the cumulative decisions and allocations made in the Forest Plan decisions. These decisions will meet the requirements of the National Forest Management Act, Endangered Species Act, and will follow NEPA procedures. These cumulative objectives will be the bench mark or trigger point for which to compare the monitoring results at different scales. The cumulative objectives will also be communicated to other state and multi-state PIF planning efforts as the National Forest contribution to the achieving objectives for the conservation of neotropical migratory birds. In addition, the Forest Service will be able to address objectives and track the success in achieving the objectives for the high priority Temporate migrants and resident species, as well as high demand game species such as ruffed grouse, turkey, and bobwhite quail, from the forest-level to a regional-level.

Appendix C. The schedule for implementing the Southern Region Landbird Monitoring Program.

Forest Biologist Meeting
October, 1994

Implementation Group

Jimmy Huntley, NFs in AL
Ricardo Garcia, Caribbean NF
Jim Herrig, Cherokee NF
Ken Dancak, Kisatchie NF
Karl Stoneking, RO - Timber
Rod McClanahan, NFs in NC
Larry Hedrick, Ouachita NF
Beth LeMaster, SRFS
Warren Starnes, NF in Texas
Steve Weaver, RO - P&B

The Implementation Group met to answer the following the questions:

1. What schedule will be followed for the implementing the monitoring program based on the forest's readiness and priority?

2. What are the estimated costs for:

- establishing the points (including monumentation)?
- conducting point counts?
- collecting vegetation data?
- data management?

The group identified startup tasks (establishment of points) and operational tasks (point censusing). The startup tasks include sampling design, training, equipment, monumentation, locating points, and first vegetation survey. The operational tasks include the census itself, data management, vegetation measurements (5 year rotation), and a 2:1 technician:biologist mix of employees. These were the basis for determining costs, work force needs, and priorities for implementing the monitoring program. All figures are based on Forest Service personnel conducting all aspects of this program. Costs and personnel needs will be lower if other alternatives are used (i.e. contracting, coop efforts). Monitoring levels have been reduced by half of the recommended levels identified by the working group in order to address lower budgets and workforce limitations. What follows are the results of the Implementation Group's work. Estimated annual costs to implement the reduced program is around $300,000.

Physiographic Unit Monitoring Program Implementation Schedule

Physiographic Units	Establish Points Year	Implement Point Counts Year
Mid-Atlantic Ridge & Valley Southern Blue Ridge Southern Piedmont West Indies South Atlantic Coastal Plain	1995	1996
Ozark-Ouachita Interior Highlands Northern Cumberland Plateau Southern Cumberland Plateau/Ridge & Valley	1996	1997
East Gulf Coastal Plain West Gulf Coastal Plain	1997	1998

Estimated number of breeding bird points counts by physiographic units and by National Forests.

Physiographic Units	Estimated Point Counts
Mid Atlantic Ridge and Valley	350
Southern Blue Ridge	500
Southern Piedmont	200
South Atlantic Coastal Plain	*300
Northern Cumberland Plateau	200
East Gulf Coastal Plain	310
West Gulf Coastal Plain	280
Ozark-Ouchita Interior Highlands	500
Southern Cumberland Plateau/ Ridge & Valley	175
West Indies	50
Total Points	2,865

Estimated number of breeding bird points counts by physiographic units and by National Forests (continued).

National Forests	Estimated Point Counts
Alabama	220
George Washington/ Jefferson	350
North Carolina	285
Francis Marion - Sumter	175
Cherokee	80
Chattahoochee - Oconee	200
Florida	200
Daniel Boone	200
Mississippi	250
Kisatchie	130
Texas	150

Estimated number of breeding bird points counts and spot mapping plots by physiographic units and by National Forests (continued).

National Forests	Estimated Point Counts
Ozark - St. Francis	200
Ouchita	300
SRFS	75
Caribbean	50
Total	2,865

*The SRFS is scheduled to conduct 75 point counts and 10 spot map grids annually that are funded independently of the NFS budgets.

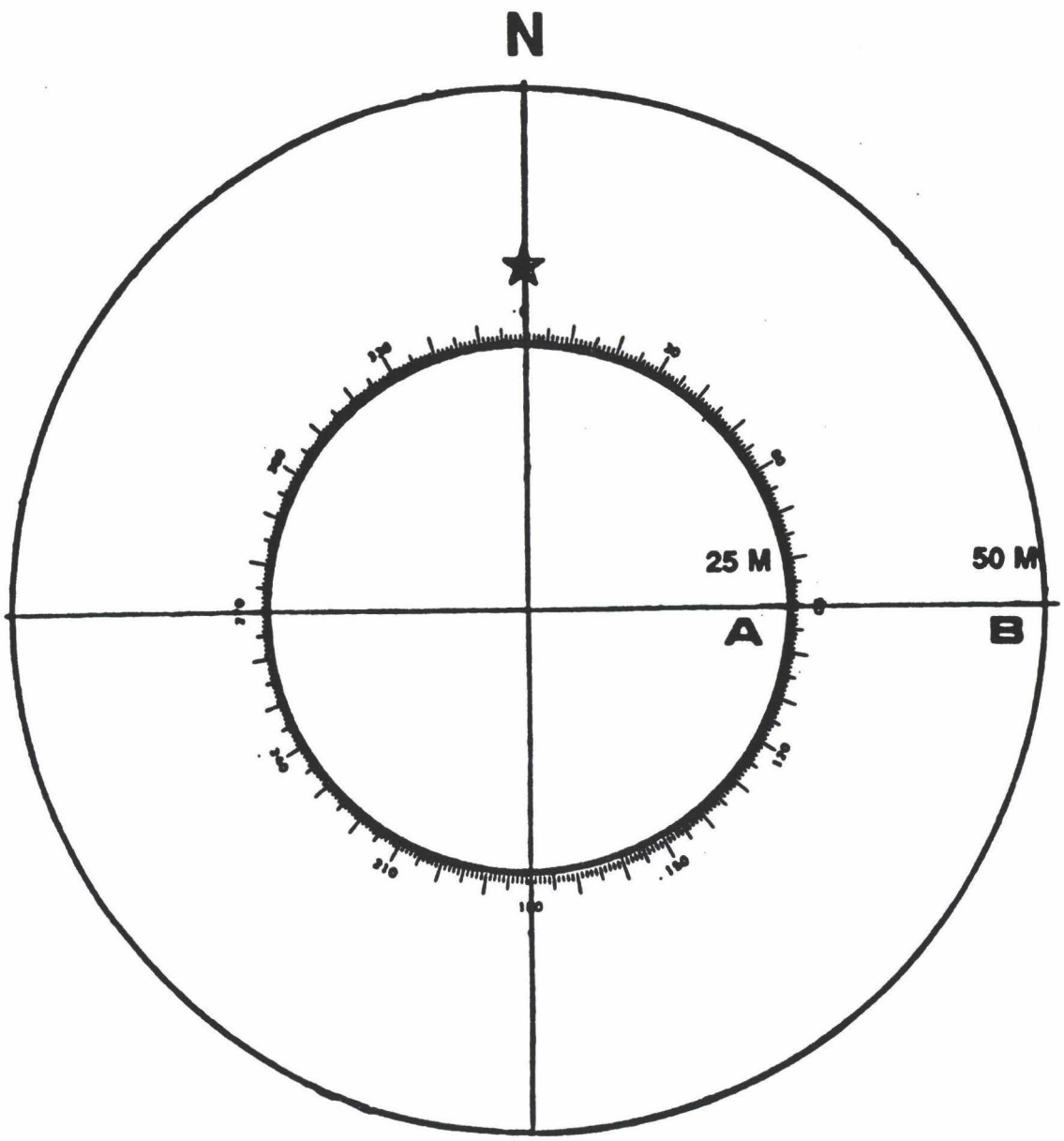
Appendix D. Breeding bird point count monitoring field forms, data entry forms, and AOU bird codes.

POINT COUNT FIELD DATA FORM

CISC HABITAT CODE _____
OBSERVER HAB.CODE _____

____ ____ ____ ____-___-___ ___:___
DIST. COMPT. STAND YEAR-MON-DAY TIME

___°___'___.__' ___°___'___.__' _____ _____ ____ ____
LATITUDE LONGITUDE OBSERVER SKY CODE WIND TEMP



FLYOVERS:

_____
_____
_____
_____
_____

SKY CONDITIONS CODES: (enter one of these Weather Bureau codes)

0 Clear or a few clouds
1 Partly cloudy (scattered)
2 Cloudy (broken) or overcast
3 Not used
4 Fog or Smoke
5 Drizzle
6 Not used
7 Snow
8 Showers

WIND SPEED CODES: (enter Beaufort Numbers on Summary Sheet, not m.p.h.)

Beaufort Number	Wind Speed miles per hr.	Indicators of Wind Speed
0	Less than 1	Smoke rises vertically
1	1 to 3	Wind direction shown by smoke drift
2	4 to 7	Wind felt on face; leaves rustle
3	8 to 12	Leaves, small twigs in constant motion; light flag extended
4	13 to 18	Raises dust and loose paper; small branches are moved
5	19 to 24	Small trees in leaf sway; crested wavelets on inland waters

POINT COUNT FIELD DATA FORM

CISC HABITAT CODE _____
OBSERVER HAB.CODE _____

____ ____ ____ ____-___-___ ___:___
DIST. COMPT. STAND YEAR-MON-DAY TIME

___°__'__._' ___°__'__._' _____ _____ ____ ____
LATITUDE LONGITUDE OBSERVER SKY CODE WIND TEMP

SPECIES ALPHA CODE	COUNT <25 M A			25-50 M B			>50 M, INCLUDING FLYOVERS C		
	0-3 MIN	4-5 MIN	6-10 MIN	0-3 MIN	4-5 MIN	6-10 MIN	0-3 MIN	4-5 MIN	6-10 MIN
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BIRD CODE	COMMON NAME
????	UNKNOWN
ACFL	Acadian Flycatcher
ALFL	Alder Flycatcher
AMBI	American Bittern
AMCO	American Coot
AMCR	American Crow
AMGO	American Goldfinch
AMKE	American Kestrel
AMRE	American Redstart
AMRO	American Robin
AMWO	American Woodcock
ANHI	Anhinga
ASTK	American Swallow-tailed Kite
ATFL	Ash-throated Flycatcher
ATSP	American Tree Sparrow
BACS	Bachman's Sparrow
BAEA	Bald Eagle
BANS	Bank Swallow
BAOR	Northern (Baltimore) Oriole
BAOW	Barred Owl
BARS	Barn Swallow
BAWA	Bachman's Warbler
BAWW	Black-and-white Warbler
BBCU	Black-billed Cuckoo
BCCH	Black-capped Chickadee
BCFL	Brown-crested Flycatcher
BCHU	Black-chinned Hummingbird
BCNH	Black-crowned Night Heron
BEKI	Belted Kingfisher
BEVI	Bell's Vireo
BEWR	Bewick's Wren
BGGN	Blue-gray Gnatcatcher
BHCO	Brown-headed Cowbird
BHGR	Black-headed Grosbeak
BHNU	Brown-headed Nuthatch
BLBW	Blackburnian Warbler
BLFR	Black Francolin
BLGR	Blue Grosbeak
BLJA	Blue Jay
BLRA	Black Rail
BLVU	Black Vulture
BOBO	Bobolink
BRBL	Brewer's Blackbird
BRCR	Brown Creeper
BROC	Bronzed Cowbird
BRPE	Brown Pelican
BRTH	Brown Thrasher
BSKI	Black-shouldered Kite
BTBW	Black-throated Blue Warbler
BTGR	Boat-tailed Grackle
BTNW	Black-throated Green Warbler
BTYW	Black-throated Gray Warbler
BUFH	Buff-bellied Hummingbird
BUOW	Burrowing Owl
BWHA	Broad-winged Hawk
BWVI	Black-whiskered Vireo
BWWA	Blue-winged Warbler
CACH	Carolina Chickadee
CAEG	Cattle Egret
CAGO	Canada Goose
CARW	Carolina Wren
CAWA	Canada Warbler
CCLO	Chestnut-collared Longspur
CCSP	Clay-colored Sparrow
CEDW	Cedar Waxwing
CERW	Cerulean Warbler
CODO	Common Ground-Dove
CHSP	Chipping Sparrow
CHSW	Chimney Swift
CLRA	Clapper Rail
CLSW	Cliff Swallow
CMWA	Cape May Warbler
COBO	Common Barn-Owl
COGR	Common Grackle
COHA	Cooper's Hawk
COMO	Common Moorhen
CONI	Common Nighthawk
CORA	Common Raven
CORE	Common Redpoll
COSN	Common Snipe
COYE	Common Yellowthroat
CRCA	Crested Caracara
CSWA	Chestnut-sided Warbler
CWWI	Chuck-will's-widow
DCCO	Double-crested Cormorant
DICK	Dickcissel
DOWO	Downy Woodpecker
EABL	Eastern Bluebird
EAKI	Eastern Kingbird
EAME	Eastern Meadowlark
EAPH	Eastern Phoebe
EASO	Eastern Screech-Owl
EAWP	Eastern Wood-Pewee
ETTI	Tufted Titmouse
EUST	European Starling
EVGR	Evening Grosbeak
FERA	Ferruginous Hawk
FICR	Fish Crow
FISP	Field Sparrow
FOSP	Fox Sparrow
GRAN	Groove-billed Ani
GCFL	Great Crested Flycatcher
GCKI	Golden-crowned Kinglet
GHOW	Great Horned Owl
GLIB	Glossy Ibis
GRHN	Green-backed Heron
GOEA	Golden Eagle
GRAK	Gray Kingbird
GRCA	Gray Catbird
GREG	Great Egret
GRRO	Greater Roadrunner
GRSP	Grasshopper Sparrow
GTBH	Great Blue Heron
GTGR	Great-tailed Grackle
GTTO	Green-tailed Towhee
GWWA	Golden-winged Warbler
HASP	Harris' Sparrow
HAWO	Hairy Woodpecker
HESP	Henslow's Sparrow
HETH	Hermit Thrush
HOFI	House Finch
HOLA	Horned Lark
HOME	Hooded Merganser
HOSP	House Sparrow
HOWA	Hooded Warbler
HOWR	House Wren
INBU	Indigo Bunting
KEWA	Kentucky Warbler
KILL	Killdeer
KIRA	King Rail
LALO	Lapland Longspur
LARB	Lark Bunting
LASP	Lark Sparrow
LBHE	Little Blue Heron
LCSP	Le Conte's Sparrow
LEBI	Least Bittern
LEFL	Least Flycatcher
LEOW	Long-eared Owl
LIMP	Limpkin
LISP	Lincoln's Sparrow
LOSH	Loggerhead Shrike
LOWA	Louisiana Waterthrush
MACU	Mangrove Cuckoo
MAFR	Magnificent Frigatebird
MALL	Mallard
MAWA	Magnolia Warbler
MAWR	Marsh Wren
MERL	Merlin
MIKI	Mississippi Kite
MODO	Mourning Dove
MOWA	Mourning Warbler
MYWA	Yellow-rumped (Myrtle) Warbler
NAWA	Nashville Warbler
NOBO	Northern Bobwhite
NOCA	Northern Cardinal
NOGO	Northern Goshawk
NOHA	Northern Harrier
NOMO	Northern Mockingbird
NOPA	Northern Parula
NOWA	Northern Waterthrush
NRWS	Northern Rough-winged Swallow
NSWO	Northern Saw-whet Owl
OCWA	Orange-crowned Warbler
OLCO	Olivaceous Cormorant
ORCR	Orchard Oriole
OSFL	Olive-sided Flycatcher
OSPR	Osprey
OVEN	Ovenbird
PABU	Painted Bunting
PAWA	Palm Warbler
PBGR	Pied-billed Grebe
PEFA	Peregrine Falcon
PISI	Pine Siskin
PIWA	Pine Warbler
PIWO	Pileated Woodpecker
PRAW	Prairie Warbler
PROW	Prothonotary Warbler
PUFI	Purple Finch
PUGA	Purple Gallinule
PUMA	Purple Martin
RBGR	Rose-breasted Grosbeak
RBNU	Red-breasted Nuthatch
RBWO	Red-bellied Woodpecker
RCKI	Ruby-crowned Kinglet
RCSP	Rufous-crowned Sparrow
RCWO	Red-cockaded Woodpecker
RECR	Red Crossbill
REEG	Reddish Egret
REVI	Red-eyed Vireo
RHWO	Red-headed Woodpecker
RLHA	Rough-legged Hawk
RNPH	Ring-necked Pheasant
RODO	Rock Dove
ROSP	Roseate Spoonbill
RSHA	Red-shouldered Hawk
RSTO	Rufous-sided Towhee
RTHA	Red-tailed Hawk
RTHU	Ruby-throated Hummingbird
RUBL	Rusty Blackbird
RUGR	Ruffed Grouse
RUHU	Rufous Hummingbird
RWBL	Red-winged Blackbird
SACR	Sandhill Crane
SAVS	Savannah Sparrow
SBAN	Smooth-billed Ani
SCJA	Scrub Jay
SCJU	Dark-eyed Junco
SCTA	Scarlet Tanager
SEOW	Short-eared Owl
SESP	Seaside Sparrow
SEWR	Sedge Wren
SMLO	Smith's Longspur
SNBU	Snow Bunting
SNEG	Snowy Egret
SNKI	Snail Kite
SNOW	Snowy Owl
SORA	Sora
SOSP	Song Sparrow
SOVI	Solitary Vireo
SPOO	Spot-breasted Oriole
SPPI	Sprague's Pipit
SSHA	Sharp-shinned Hawk
STFL	Scissor-tailed Flycatcher
STHA	Short-tailed Hawk
STSP	Sharp-tailed Sparrow
SUTA	Summer Tanager
SWHA	Swainson's Hawk
SWSP	Swamp Sparrow
SWTH	Swainson's Thrush
SWWA	Swainson's Warbler
TRES	Tree Swallow
TRHE	Tricolored Heron
TUVU	Turkey Vulture
UNOW	UNKNOWN
UPSA	Upland Sandpiper
VEER	Veery
VEFL	Vermilion Flycatcher
VESP	Vesper Sparrow
VIRA	Virginia Rail
WAPI	Water Pipit
WAVI	Warbling Vireo
WBNU	White-breasted Nuthatch
WCPI	White-crowned Pigeon
WCSP	White-crowned Sparrow
WEKI	Western Kingbird
WEME	Western Meadowlark
WETA	Western Tanager
WEVI	White-eyed Vireo
WEWA	Worm-eating Warbler
WFIB	White-faced Ibis
WHIB	White Ibis
WIFL	Willow Flycatcher
WITU	Wild Turkey
WIWA	Wilson's Warbler
WIWR	Winter Wren
WODU	Wood Duck
WOST	Wood Stork
WOTH	Wood Thrush
WPWI	Whip-poor-will
WTSP	White-throated Sparrow
WWCR	White-winged Crossbill
WWDO	White-winged Dove
YBCH	Yellow-breasted Chat
YBCU	Yellow-billed Cuckoo
YBSA	Yellow-bellied Sapsucker
YCNH	Yellow-crowned Night Heron
YERA	Yellow Rail
YHBL	Yellow-headed Blackbird
YSFL	Northern (Yellow-shafted)
YTVI	Yellow-throated Vireo
YTWA	Yellow-throated Warbler
YWAR	Yellow Warbler

BIRD POINT COUNT HABITAT DATA SHEET

DATE: _____ POINT NUMBER _____

NON-HABITAT VARIABLE TO COLLECT:

1. ELEVATION(elev.in ft.) _____ 2. ASPECT(0-360 degrees) _____ 3.(0-90%)_____
4. WATER (circle appropriately)
   a. present; b. absent, c. flowing, d. fresh, e. brackish, f. salt,
   g. w/in 50 meters, h. between 50 meters and 100 meters.

HABITAT VEGETATIVE VARIABLES:

1. DOMINANT AND CODOMINANT CANOPY:
   a. FOREST TYPE (use CISC codes that describe overstory) _____
   b. STAND AGE (use CISC information) _____
   c. AVE. DBH (diameter at breast high) _____
   d. CANOPY HEIGHT (ave. tree height) _____
   e. BASAL AREA (total square feet/acre of dominant trees
      1). hardwood basal area ____
      2). conifer basal area ____
      3). hardmast basal area ____
   f. PERCENT CANOPY COVER (check one)
      1). 0% ____ 2). 1-25% ____ 3.) 26-50% ____ 4). 51-75% ____
      5). 76%-100% ____

2. MID-STORY LAYER (vegetation between 8 and 30 feet in height):
   a. DOMINANT VEGETATION (list dominant species in general categories based on ocular obs.)
      1). Deciduous: _____
      2.) Coniferous: _____
      3). Evergreen: _____
   b. PERCENT CANOPY COVER: (check one)
      1). 0% ___ 2). 1-25% ___ 3). 26-50% ___ 4). 51-75% _____
      5). 76-100% ____

3. SHRUB LAYER: (vegetation between 1.5 and 8 feet in height):
   a. DOMINANT VEGETATION (list dominant species in general categories based on ocular obs.)
      1). Deciduous: _____
      2.) Coniferous: _____
      3). Evergreen: _____
   b. PERCENT CANOPY COVER: (check one)
      1). 0% ___ 2). 1-25% ____ 3). 26-50% ___ 4). 51-75% _____
      5). 76-100% ____

4. HERBACEOUS LAYER (vegetation below 1.5 feet in height):
   a. DOMINANT VEGETATION (list dominant species in general categories based on ocular obs.)
      1). Woody: _____
      2). forbs/sedges: _____
      3). Grasses: _____
   b. PERCENT CANOPY COVER: (check one)
      1). 0% ___ 2). 1-25% ___ 3). 26-50% ___ 4). 51%-75% _____
      5). 76-100% ____
   c. GROUND DESCRIPTION (ocular est. from point center of following categories, circle appropriate ones))
      1). litter 2). open glade 3). bare ground 4). moist
      5). standing water

5. OTHER KEY HABITAT COMPONENTS:
   a. STANDING SNAGS (note snags greater than 10"dbh by species, number of cavities/snag and bird species, if any, using the cavities)

TREE SPECIES	DBH	#OF CAV./SNAG	BIRD SPP.(if any)
_____	___	_____	_____
_____	___	_____	_____
_____	___	_____	_____
_____	___	_____	_____
_____	___	_____	_____

   b. LIVE CAVITY TREES (An ocular est. of the total point for the following categories.)
      1). greater than 12"dbh to 20" dbh _____
      2). cavity trees greater than 20" dbh _____